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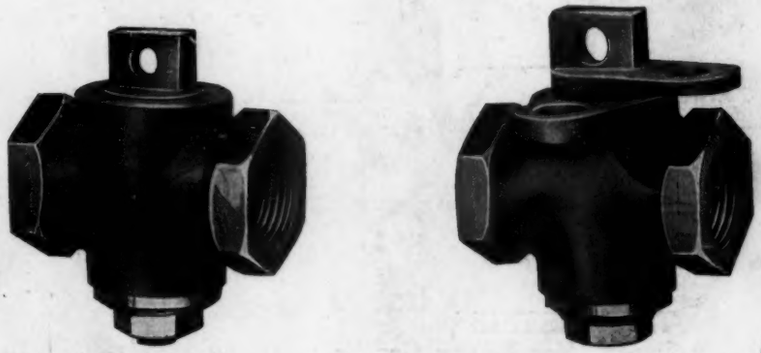
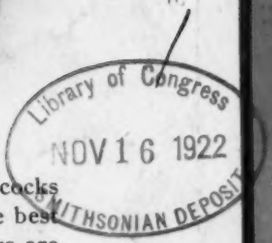
Lattimer - Stevens
Iron Body Stop Cocks





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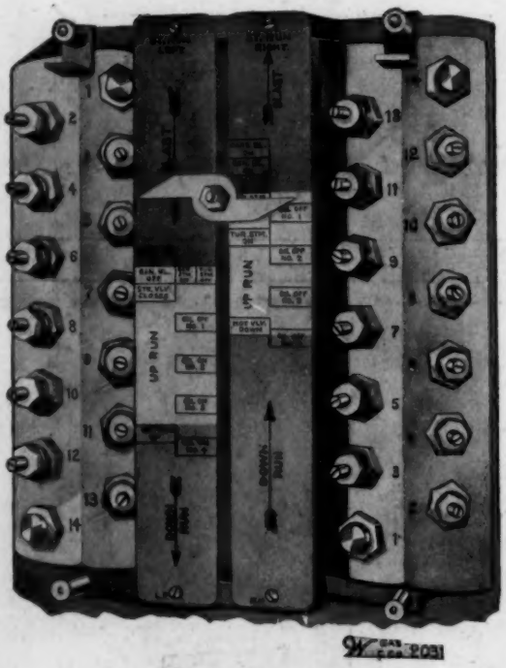

Close-up of the Indicator
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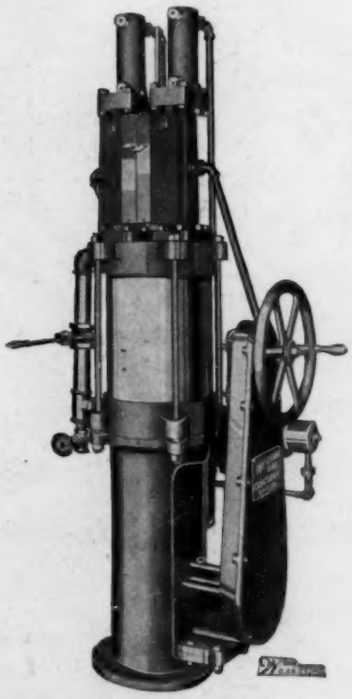

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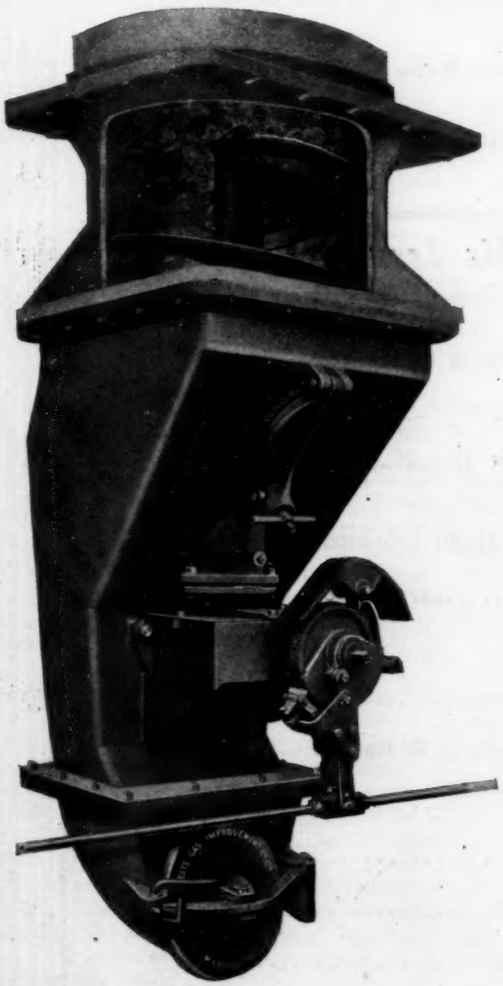

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American Gas Journal

SIXTY-THIRD YEAR

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Gas Betterments in Los Angeles

A Mammoth Program of Expansion That Is Being Carried Out

By DONNA E. COLLISTER

It is a well-known fact that during the past few years Los Angeles has increased in population more rapidly than any other city in the United States, perhaps in the world. This has brought with it unprecedented industrial expansion. Old plants and factories have in many instances doubled or even trebled their capacities. Excessive demands upon the great system of the Los Angeles Gas & Electric Corporation have followed as a matter of course. Indeed, the demand for gas has grown even more rapidly than the city's population, for in addition to its industrial importance gas has come to be the almost universal fuel for domestic purposes and all heating in this section of the country.

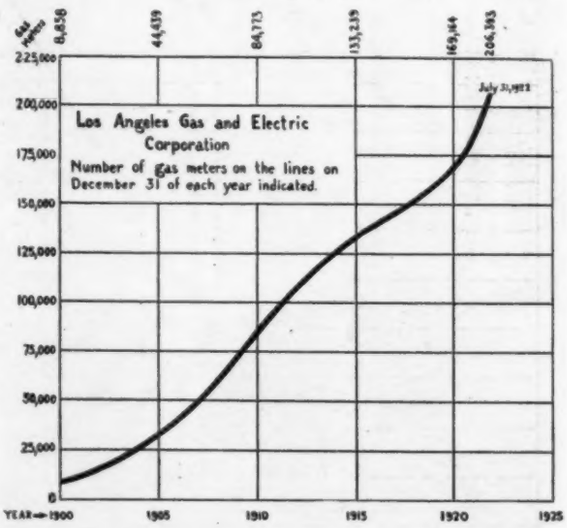
This rapid and prolonged expansion which has been in progress since the close of the war has evolved a serious problem in engineering, financing, and plain hard work which only a seasoned gasman can appreciate. The accompanying graph suggests this problem, but it fails to tell the whole story. In the years since 1915 the new and broader uses of gas have so augmented the demand that the per cent of increase in annual consumption has been three times as great as the per cent increase in the number of meters. This condition has called for heroic treatment.

The gas served to the patrons of the Los Angeles Gas & Electric Corporation is a mixture of natural gas and oil gas with a heating value of 750 B.t.u. As there are very definite and well understood limitations on the supply of natural gas, the effort has been directed to an increase in the production of oil gas.

The gas works is situated in the industrial district of the city of Los Angeles, where much adjoining property has had to be purchased to provide room for plant expansion. Also generators of small capacity occupying valuable space were removed and the ground cleared for the construction of larger and more efficient units.

Perhaps the items of greatest interest in the betterment program are the generators. During 1921 seven generators were erected. They are twenty-two feet in diameter and thirty-five feet in height, and have a combined daily normal capacity of nearly 28,000,000 cu. ft. of gas. Three additional and larger generators now under construction will be completed in time for service during the winter of 1922-1923. They are twenty-seven feet in diameter and forty-five feet high and will have an estimated combined normal capacity of 21,000,000 cu. ft. of gas in twenty-four hours. These are the largest oil gas generators in the world and will be surmounted by boilers to utilize the waste heat of blasting. This is an innovation in oil gas generators.

Of course, this increased generating capacity called for a corresponding increase in auxiliary equipment, storage capacity, and so forth. The 1921 program included five water scrubbers, each fifteen feet in



diameter and sixty feet high, and three oil scrubbers, each twenty feet in diameter by sixty feet high. During 1922 there will be built six oil scrubbers and four water scrubbers, each seventeen feet in diameter and seventy feet high. The purifier units of recent design are circular in form, seventy-four feet in diameter and sixteen and one-half feet high. Two of these for 1921 and two for 1922. Wash boxes of appropriate size are, of course, installed in connection with all of the generators.

Los Angeles Gas & Electric Corporation was the discoverer of and pioneer in the use of the oil gas scrubber process for eliminating naphthalene. This process is now used by most gas companies on the Pacific Coast, although it has not yet been adopted in the East. An accompanying photograph gives a good view of the twenty by sixty foot oil gas scrubbers erected in 1921 at the Los Angeles gas works.

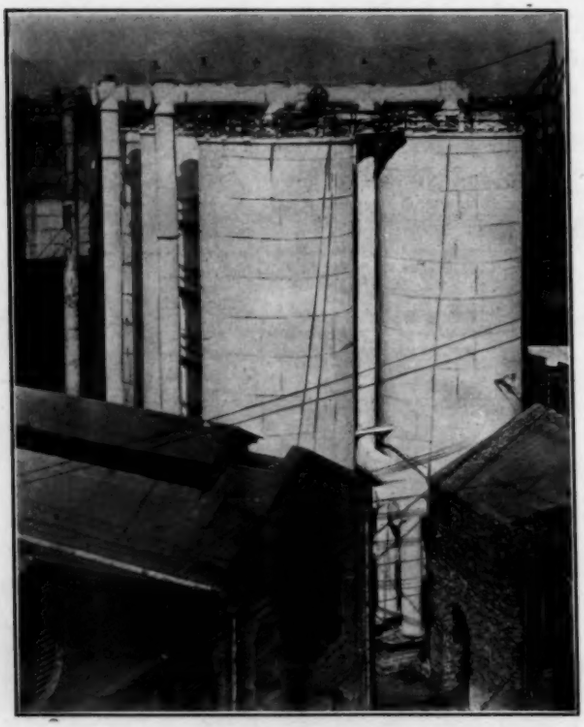
A single-lift relief holder of 1,000,000 cu. ft. capacity was erected in 1921. A five-lift storage holder of 10,000,000 cu. ft. capacity was completed during the present year. The storage holder has a maxi-

mum diameter of 273 ft. 3 in. The foundation for the holder is a concrete disk 274 ft. in diameter and 12 in. thick, except for a twelve-foot ring at the circumference, which is 24 in. thick. The total weight of the holder, foundation and the water necessary to fill the tank is 78,600 tons, which gives a bearing weight of one and one-third tons per square foot of the area occupied by the foundation.

Both of these holders were erected by the Bartlett Hayward Company, of Baltimore.

Holder in Pasadena

A contract has been made for a 6,000,000 cu. ft. holder to be located in Pasadena. A 10,000,000 cu. ft. holder is being planned for the southwestern section of the city of Los Angeles, and property has been acquired upon which to erect a 10,000,000 cu. ft. holder in the northwestern part of the territory served by the corporation.



Oil Gas Scrubbers Erected in 1921

At the compressor station two compressors are being installed each with a capacity of 1,000,000 cu. ft. of gas per hour. Upon completion of this year's betterment program, the corporation will have high compression capacity of 5,330,000 cu. ft. per hour and low pressure blower capacity of 3,000,000 cu. ft. per hour. Probably this compressor station is the largest in capacity in the world.

Much miscellaneous betterment work has also been done and is now in progress, such as boilers, water

Oil Gas Generators

development, carbon briquet making apparatus, etc. Water is being developed by means of an underground gallery, and brought to the surface by large pumps placed underground. At the briquetting plant are being installed four additional separators, four dryers and two briquet presses to handle the carbon produced from the increased volume of gas which will be made in the new generator sets.

The Distributing System

The distributing system this year will be enlarged by the installation of probably 200 miles of new gas mains, ranging in size up to thirty inches in diameter. Some of this mileage consists of feeder mains into outlying districts. These include an entirely new sixteen-inch line from the compressor station to feed the southwest section of the corporation territory, a new sixteen-inch line through Monterey Pass Road to serve Monterey Park, Alhambra and San Gabriel districts, the completion of the sixteen-inch line through Hollywood district which was started last year, the completion of the sixteen-inch line to Pasadena, part of which also was laid last year. In addition to this Pasadena feeder line, a twenty-four-inch low pressure main is being laid from the Pasadena works by way of Marengo Avenue to Orange Grove Avenue, a distance of approximately two miles. Last year 150 miles of pipe, similar to that now being installed, was laid. Still the demand for gas increases.

During 1921 the number of gas meters in circuit was increased over 22,000, and for the first seven months of 1922 the increase was more than 15,000 meters. The investment in gas betterments in 1921 was increased more than $6,000,000, while in 1922 increase in investment will be considerably in excess of $8,000,000, and there is no let-up in sight for 1923.

For this article I am greatly indebted to the kindness of William Baurhyte, vice-president; D. L. Scott, statistician, and A. B. Day, general superintendent of the Los Angeles Gas & Electric Corporation, who furnished the data cited, much of which is given in their exact words.

Consumers' Meters

An Important Contribution to the Discussion of This Topic

By H. A. NORTON

In discussing the subject assigned to me—"Consumers' Meters"—I realize that interest lies in present day conditions and those which will confront us in the near future. I think, however, I should refer somewhat to the history and record of the consumer's meter, that you may know the number of years this meter has been in use, and the wonderful record for accuracy and durability it has made for itself since it was invented. When manufactured gas was first produced commercially in England, it was sold on the basis of the estimated number of feet per hour for each burner. Such computation was obviously not only unsatisfactory, but unprofitable. The result was the diligent search for a means of ascertaining the exact amount used by each customer. But it was not until Clegg in 1815 brought his wet meter to a state of approximate perfection that the gas business became commercially safe and profitable. Clegg's wet meter turned the uncertain fortunes of the experiment of manufacturing gas into a commercial success.

Here is a paper that every gas company should carefully preserve. It was prepared by an expert as part of the educational course for industrial gas salesmen of Massachusetts Institute of Technology. We are sure the industry will realize the importance of this paper.—Editor.

This wet meter, with many improvements, and imperfections corrected, is to this day used as a station meter for ascertaining correctly the volume of gas made at the works before it is stored in the holder, for the correct measurement of small volumes in an experimental or laboratory process, and to some extent in England and the Continent as a consumer's meter.

It has been largely replaced for the latter purpose abroad, and entirely in this country, by the more convenient dry meter. This type of meter was not evolved, however, until 1843, when Richards, another Englishman, invented and patented the ideas and principles incorporated in our present consumer's meter, which was perfected several years later by Thomas Glover, whose name is closely associated with the dry meter in use to-day.

While we manufacture meters of every description for measuring gas in any quantity, yet the meter generally in use for measuring manufactured gas to the consumer is the so-called Glover two-diaphragm, slide valve meter. This standard dry meter has a rectangular case made of tin plate. Internally it is divided into three principal chambers, separated by two partitions. One partition is set horizontally, and is known as the valve table, which forms the upper chamber; the other is set perpendicular to this and divides the lower part of the meter into two chambers. In each of the lower chambers there is a leather diaphragm, the motion of which is transferred by means of a vertical flag rod through a stuffing box to the upper chamber.

Both flag rods are connected by jointed arms to a revolving tangent mounted on an eccentric or crank, which in turn actuates two slide valves by means of valve arms. The valves are located in a separate enclosure, from which the crank projects through a stuffing box. A worm or spiral is mounted on the upper part of the crank, which operates a gear mounted on a horizontal axle, transferring the registration to the index.

The gas enters the meter at the inlet side, and passes through the ports of the valves, which open into the diaphragm. The gas inflates and deflates the diaphragms with a reciprocal motion, thence passes back through the channels and to the outlet of the meter. The cubical contents of the diaphragm are calculated mathematically, and the measurement is by displacement of volume. The travel of the diaphragm is regulated by the position of the tangent on the crank, and by this means accuracy of measurement is established.

In testing the meter a known amount of air or gas is passed through the prover and then through the meter. If the meter does not register the same as the prover, the tangent is adjusted to correct the error. This tangent adjustment positively cannot vary through the operation of the meter itself. The mechanical motions involved are positive, as the meter is so constructed as to keep these mechanical parts in the proper relation one to another. Therefore, a properly adjusted meter will give accurate measurements. This is why the meter is accurate in the first place and why it stays accurate over a long period.

Construction Strengthened

In the early days of its manufacture, the meter was constructed to pass a limited amount of gas at a limited pressure and with a slow motion. With the

ever-increasing peak load demand now placed upon the majority of consumers' meters, we have greatly strengthened the construction of the meter, increased its capacity, but retained the original slow motion or revolutions per foot of gas passed.

In the earlier days with a lighting load and a limited demand for fuel purposes, there was less liability of overloading the meter, or placing an unusual demand or strain upon the working parts than has been evident in more recent years. In selling gas appliances you are really selling service, and in order to give good service you must have behind the appliances in use volume of gas, as well as pressure, which means adequate street mains, services and meters.

In your canvass to increase the sales of gas per consumer and per meter, you must not overlook the size of the street main, the service or the meter, or overload any one of these with the peak load demand you have sold the consumer. I assume that you are all optimistic as to the future for the sale of gas, and that gas appliances now sold and properly installed will not only be continued in service, but that this will lead gradually to an increased use of gas by each consumer.

With the possibilities of increasing the sales of gas per meter, you should see to it that the installation of the service and meter is adequate to give the necessary volume as well as pressure for some years to come. The lifetime of mains and services is far in excess of that of the gas appliance to be installed. The average lifetime of the meter is approximately thirty years. It would appear to be good judgment, therefore, to install meters, as well as services, in excess of the present indicated peak load demand.

Should Know Meter Capacity

We find that some difficulty is experienced by meter setters in not knowing that our meters of a given size have a greater capacity than heretofore. We have greatly increased the capacity of all our meters, and in some instances have doubled the former capacity. Therefore it is very important that the meter setter should know the capacity of the meter which is installing, and for that purpose we have repeatedly mailed circulars, giving the different capacities of the meters in the same sizes and in all sizes.

Great care should be exercised in handling and installing consumers' gas meters. While the record shows that they are exceedingly durable, yet it should be borne in mind that the meter is a measuring device which when delivered to the department in charge of setting meters, is accurate, and will continue so, if properly handled and connected.

It is not to the credit of the meter, the gas company, or its employees to place meters in an unsuitable location, indicating the possibility that they are ashamed to have the meter where it can be readily seen. Nor must it be assumed that the location of the meter will not affect its accuracy, for the facts are quite to the contrary. When you are troubled with a service pipe collecting frost periodically, you do not hesitate to change the location of that service. When you are troubled with the continued inaccuracy of a meter in a bad location, you should change the location of that meter.

You will find difficulty at times in new plants and buildings in getting the proper space and location for the consumers' meters. Many architects and builders ignore the necessity of arranging for the proper location of meters. It should be the duty of some member of your organization to keep in touch with new buildings, for these are always good prospects as potential consumers, and arrange for the necessary gas service and proper location for the meters.

It is well worth your consideration to place meters in a suitable location where temperature changes are not extreme, and particularly where they are of easy access not only to your meter readers, but to your consumers, whom you should try to educate to read the meter and keep a daily or weekly check upon the amount of gas they are using. I would impress upon you the advantage to your companies resulting from your consumers' reading the meter index at regular intervals, and thus constantly impressing your consumers with the accuracy of the meter.

High bills are never due to fast meters. A meter that might be fast enough to affect the consumer's bill would not function and would be removed for poor service. All the records show that the average error is invariably on the slow side, and in many cases individual meters are exceedingly slow up to the point of passing gas and not registering.

Great care should be used in removing meters from service, especially meters which are to be retested and placed in service again. Meters removed from service should be immediately recapped to exclude the air. I quote Charles D. Jenkins, chief of the Gas Inspection Division, Department of Public Utilities of Massachusetts:

Directions for Meter Testing

"In testing meters particular attention must be paid to temperatures. The temperature of the meter, the water in the holder, the air in the room and in the holder should not vary more than 2 deg. Fahr.; if so, adjust them either by changing the temperature of the air or water; if it is necessary to change the water be sure it is thoroughly mixed before testing.

"Connect the meter with the holder and test for tightness by allowing enough air to run through to start the meter, then stop the outlet and shut off the holder, noting the pressure on the gauge; after standing 30 seconds the holder is turned on, and the pressure should not drop more than 2/100 of an inch. More would indicate a leak or faulty temperatures; if a leak, find it and stop it. Then turn on holder again and run, for small meters (3s, 5s and 10s) at least half a foot to starting point, finishing with rate on; for larger meters run from one to ten feet. The legal rate, the one generally used, is six feet per hour (one-tenth of a foot per minute) for each light the meter is marked to supply; i. e., thirty feet per hour for a five-light. It is better to start from a side point on the dial than from a top or bottom one.

"The holder is now set at zero, or some chosen point, and turned on to the meter until the experiment hand has made a complete revolution, the holder being shut off when the hand reaches the starting point exactly. The amount of air used in holder is divided by amount registered by meter and the result is in per cents; e. g., with a two-foot circle the holder indicated 1.95 ft.; 1.95 minus 2.00 equals 0.975, making the meter 2.5 per cent fast.

"The holders are generally marked to read per cents, directly on two, five and ten foot runs.

"The essence of accurate meter testing lies in temperatures. The holder must be protected from the sun and draughts of air, meters should be kept off the floor and the person making the test should know that the temperature of the meter is the same as that of the holder and room air. During the winter months meters should stay in the proving room ten or twelve hours before being tested."

The above directions, however, cover only the legal rate test, which is at the rate of six times the so-called meter light. It has been found better practice to test all meters on both the legal rate and the open outlet.

These directions were written for us over twenty years ago, and distributed periodically, and they cover what should be the standard practice of every gas company to-day.

Under the law a meter 2 per cent fast or 2 per cent slow is correct. A meter removed from service and which tests correctly should, before it is again placed in service, be tested by the slow light. It should be connected with gas, and the outlet burner turned down to a small or one-half foot light. The proving circle, or the leak indicator circle, should be marked so as to determine that the meter will make one revolution of the tangent in a limited time, thereby registering any amount of gas passing through the meter. At times a meter will test correctly on the prover for accuracy, and still have an inside leak, either in the valves or diaphragms, and pass an appreciable amount of gas without registration.

Meters that have been in service for a limited period since they were new or repaired, and which do not test correctly, may require only adjustment and no repairs. After the top has been removed, you may test for tightness by the so-called four-point test with gas at a pressure not exceeding 1½". To do this, connect the meter with gas, using on the outlet a bank of burners, or a ⅛" burner cock. Purge the meter of the air and light the burner. Disconnect the flag arms and point the tangent in line with the center of one of the valves. The gas in this compartment should burn out quickly and the light thus extinguished. Then move the tangent to the second, third and fourth quarters or points, light the gas and test as above. If the gas goes out completely on all four point, you have a tight meter, and the adjustment of the tangent is all that is required to bring the meter to a correct proof.

The Four-Point Test

You may also make the four-point test as we do, with the meter connected to the meter prover, and the prover weighted to give 1½" pressure. We use air for this purpose and the pressure gauge indicates the tightness of the meter on the four points.

A slight change in the accuracy or test of a meter originally correct when placed in service may be caused by a slight bind or drag in the working parts. If the inaccuracy is on the fast side, you should try the travel or clearance of the diaphragms on all four compartments to see if they have contracted. To do this disconnect the meter, leaving the inlet and outlet open to the air. Then disconnect the flag arms from the tangent. Inflate the back diaphragm with air, working by hand the long part of the flag arm to a position parallel with the gallery of the meter. Point the short part of the flag arm in line with the tangent. The opening in the short arm which fits over the tangent bat should not travel beyond the bat, but should have such clearance as to allow the diaphragm in motion to make its complete travel without jumping.

Make this test on all four points with the diaphragms inflated and deflated; otherwise you will have a meter that will not properly function, and which will give an unsteady flow of gas in service.

In that event, the back and front of the meter should be removed and the diaphragms carefully reoiled. Should you find much condensate in the diaphragm chamber, better results will be obtained if the meter is permitted to remain open twenty-four hours and the leather thus allowed to dry out before reoiling. A dry leather will absorb the oil much better than one which contains more or less moisture. You will also get better results if you heat the diaphragm oil to a temperature of 110 deg. Fahr.

Test for Tightness

If after removing the top from an incorrect meter and the four-point test indicates a leak, the valve enclosure plate should be removed and the valves, channels and diaphragms tested for tightness. To test the valves and channels, connect the outlet of the meter with either air or gas at not over 1⅛" pressure. A pressure gauge should be connected between the meter and the stop cock. By watching this gauge as you shut off the supply, a leak will be indicated by a drop in the water column. If the valves show a leak, they should be reground and fitted tight.

Testing the Diaphragms

Then remove the valve covers to test the diaphragms, using the same gauge that is used for testing the valves. A special connection should be provided to fit the valve openings leading to the inside of the diaphragms. This connection, attached to flexible tubing, is held in place by hand and is made gas tight by a washer of sponge rubber. If the diaphragms are not tight, and cannot be made so by reoiling, they should be replaced with new ones and tested for tightness as above.

The age limit for diaphragms that can be reoiled and continued in service, during the next periodical test date, depends upon the quality of the gas, the location of the meter, and the amount of gas the meter has passed at varying speeds. From our observation we recommend that diaphragms be left in meters not more than fourteen years.

During the first six months of this year we kept a careful record of 12,000 meters of our own make which were sent to us to be repaired. Many of these meters were from customers who do not maintain a repair shop of their own and which, therefore, required only minor repairs. Many were old three-lights which had outlived their usefulness, and were not worth further repairs, which we condemned, following the policy adopted by a majority of our customers not to spend money on such out-of-date and worthless equipment.

Two thousand eight hundred and thirty-eight of the number received were fitted with new dia-

phragms; and in 1,618 of these 2,838 meters the original diaphragms had been in service from fourteen to twenty-four years without replacement. It is true that these meters were giving some kind of service, but test before repairs developed the fact that the majority of them were either very slow or D. R., which demonstrates the inadvisability of continuing meters in service until they break down or are removed for other reasons than the suspicion that the consumer is not paying for all the gas that is passing through the meter.

I have suggested the four-pointing of meters, the testing of valves and diaphragms at not over 1½" water pressure. Harm may result from subjecting the sewing in the seams to over 1½" pressure. The meter in service, no matter what the initial pressure is, should not be worked at over 1½" differential. This means that the diaphragms and valves are not subjected to over ½" pressure, since the pressure is within ½" of being equalized on each side of the diaphragms and valves.

All new and repaired meters are subjected to a two-pound air pressure for tightness of the case, before the meter is topped. In testing the meter through the inlet with this two-pound pressure, the tangent should be permitted to make a full revolution before shutting off the outlet cock. This insures an equal two-pound pressure in each compartment of the meter. The meter is then submerged in a tank of water, and a leak of any size is immediately detected by the bubbles caused by the air coming through the leak. If you do not use the water tank test—and we do not use it in testing prepayment meters—you can detect any leak by testing with the two-pound pressure and the use of soap suds brushed over the seams and stuffing boxes.

After the top is soldered in place, we test the upper part of the meter through a hole in the top with 18" pressure. I will later demonstrate how these different tests are made with the meters before me, as well as to explain more in detail the construction and operation of the Glover, two-diaphragm, slide valve meter.

A meter works fast usually from the contraction of the diaphragms, and only to a limited per cent, beyond which the meter will not function.

A meter works slow from an overload, which creates lost motion, leaky valves or diaphragms, and from breakdown due to continuous service without repairs. You may be positive in your statement that an unusual or large gas bill is due to the use or waste of gas and not to a fast meter.

There should be a systematic, periodical date for testing all consumers' meters. From different analyses of meter tests which have been summarized in the past four years, a seven-year period is recommended. I have summarized these meter tests in five, seven and ten year periods, and it is from these results that I recommend the seven-year period. It is very evident from the records of meter tests that meters do not need to be brought in from service to be tested in less than seven years. I have, therefore, recommended leaving idle meters in service shut off. It is a waste of money to bring a meter into the repair shop once, twice, or three times every year, and it is certainly better for the meter to be left connected in service.

Avoiding Useless Expense

The interest on the investment required for the purchase of new meters by leaving idle meters in service is exceedingly small in comparison with the expense involved in removing the meter when it is shut off. You can well afford to leave an idle meter shut off for a period of at least nine months. You further relieve your meter department of the unnecessary testing of these meters two or three times a year, and thus avoid useless expense.

There should be a systematic, periodical date for the repairing of correct meters. It is not good practice to continue a meter in service until it breaks down. In that event, you have interfered with the consumer's service, and if the meter has been used by him for any considerable period, you will generally find the meter extremely slow or D. R. This very slow or D. R. meter causes trouble when a correct meter is placed in service, for the consumer's bill immediately increases in proportion to the amount that the former meter was on the slow side.

We have had meters returned to us for repairs, which had been in continuous service for over thirty years without having the diaphragms reoiled or replaced. While this confirms the durability of the Glover type of consumers' meters, yet it is bad practice, and a systematic, periodical date should be adopted for the repairing of correct meters. Gas companies, as a rule, annually go over the apparatus used in the manufacture of gas. It is no less important to repair periodically the station meters and consumers' meters which measure the amount of gas manufactured and sold.

The Seven-Year Period

I will not go into detail covering the accuracy of the meters summarized in the past four years, because many of these tests have been published. The percentage of correctness of five-light and larger meters, new or repaired, seven years in service, shows from 70 to 80 per cent correct. The curves on the charts show that the seven-year period is the one where the change in the accuracy begins to take place.

The three-light meters show a much smaller percentage correct, generally due to old age and overload. We find the majority of very slow or D. R. meters are those which have been left in service for too long a period without repairs, and have broken down, as well as the meters which have been overloaded from the start and have developed lost motion.

The amount of money that can be saved by leaving idle meters in service shut off, and the elimination of incorrect meters by adopting a systematic, periodical test date and repair date, will be greater than the expense of maintaining such a system. Thus we have the four cardinal points, on which I venture to lay a further emphasis:

First—Leaving idle meters in service for the period which I have suggested, of at least nine months, which has been demonstrated to be the most practical period.

Second—The systematic establishment of a periodical testing date, which after many years of study I have established in my own mind as seven years,

and which I believe will be found to be the proper period.

I feel I should, however, sound just this note of warning, that if you are to replace meters in service after seven years that have been found to be correct, it should be with the thorough understanding that you are to put in force the next cardinal point, which is—

Third—The periodical repairing of correct meters, which should not extend beyond the second seven-year test date, or fourteen years. With this system of periodical testing and repairing there will be found to be a marked improvement in the reduction of the unaccounted for gas, and great comfort in your own mind in knowing that the meters which you are using to measure gas to your consumers are as nearly correct as it is possible to have them.

The fourth cardinal point is, of course, to my mind —and you can appreciate my position—equally as important as the other three. This is the elimination of worn-out equipment and replacing of meters of small capacity with those of increased capacity and stronger construction. Although you may consider me to be prejudiced, I can assure you that it pays in dollars and cents to eliminate incorrect meters and those beyond the stage of profitable repairing.

With the installation of any gas burning appliance, you are vitally interested to have the consumer satisfied with the service rendered and with the cost of operating that gas burning appliance in comparison with other fuels. It is usually the first few months' use of the appliance which sells it to the consumer. You, therefore, should start under the best conditions possible, and with a meter which registers correctly the amount of gas consumed. You should see to it that the meter continues to render good service and to indicate correctly the amount of gas the appliances are using. This can only be guaranteed by a periodical date for testing and repairing your consumers' meters.

Co-operative Advertising Campaign in Dallas

Gas Company Takes the Public into Its Confidence

By MARY L. TENERY

The Dallas Gas Company, one of the leading gas utilities of the Southwest, and an important factor in the development of the city of Dallas, recently inaugurated a publicity campaign telling the story of natural gas, its production, transportation and consumption, through newspaper advertising. The campaign touched upon the economics of the natural gas situation in a manner that was educative and helpful to the public at large, by helping them to understand and appreciate the service rendered by gas companies.

This campaign idea of advertising is not new, having been used by the gas industry for the accomplishment of various results, but always with a well-defined plan upon which has depended the success of the copy. R. E. Brady, advertising director of the Dallas Gas Company, who planned and directed this campaign, had as his primary idea a drive that would be educational and at the same time formative of public sentiment in the matter of a keener appreciation of this essential utility. Mr. Brady kept this idea of a well-defined plan in mind when he first began the preparation of his copy, and long before the first advertisement of the series appeared he had taken into careful consideration the results he wished to obtain, and weighed local conditions that might affect, favorable or otherwise, the reception of his copy.

Mr. Brady wished also to make this series of advertisements more than mere paper and ink. He wished to give them individuality and, feeling that the object of the average newspaper reader is to glean news rather than to scan advertisements, he directed his efforts to making his copy complete with the news columns in order to assure attention.

With these points in mind, the actual planning of the series was begun, and each individual advertisement of the thirty which made up the series was written to conform to certain standards. The first object was to see that the matter presented should not only be interesting *per se* but that it should at the same time disseminate valuable information pertaining to operation.

A second consideration was to suggest to the reader the labor-saving and convenience of the utilization of gas. And in line with this point came the instructions necessary to secure absolute satisfaction on the part of the customer. The reader was instructed as to how to get the best results from the use of gas in the home by proper attention to appliances used and the right methods of using them. They were shown how to eliminate some of the most flagrant mistakes and wastes due to improper methods of operation. Attention was also given as to the proper care of appliances and the adjustments that might be necessary for the consumption of natural gas. The consumer was given instructions on meter reading and the computing of the gas bill, giving opportunity for a more economical use of the product. How to test leaks and avoid hazards was told in a detailed way, and any other procedure that would make for the economical consumption of gas in the home was touched upon.

Mr. Brady was careful to avoid the use of technical terms, presenting his information in clear, simple language. And, further to drive home each point as he made it in as concise a manner as possible, he covered only one phase of his subject in each advertisement.

The series of advertisements as they finally appeared in the press were uniform in appearance and easily identified. Each ad retained the same newspaper set-up, in a space three columns wide by 10 in. high. Every effort was made to keep the copy as dignified as possible, and no decoration was used; merely, when occasion demanded, an appropriate descriptive cut.

Further to maintain this atmosphere of uniformity, Mr. Brady obtained a certain preferred position in each newspaper carrying the copy and retained this throughout the campaign. The three leading daily newspapers

in the city were chosen as the medium, and two advertisements were released each week. Alternate publication dates were used, making, for example, the first ad appear in one paper on Monday, in the second on Tuesday and in the third on Wednesday, while the second advertisement would appear consecutively in the papers on Thursday, Friday and Saturday.

A brief summary of the various advertisements of the make-up of the entire series follows, in the order of appearance. This sequence is the result of careful thought on the part of Mr. Brady, who planned the campaign with a view of making each advertisement lead up to the next and in a way form a continued story of natural gas.

Advertisement No. 1: *Announcement to the Public*—This advertisement was the forerunner of the campaign, stating clearly the purpose of the publicity and the results hoped for in a concise manner. The customer was asked to read and preserve the series, since by a thorough study of the copy he would profit materially.

Advertisement No. 2: *Company Facts*—This ad gave the reader a statement of the size of the company, an idea of the money invested, the number of customers and the amount of gas delivered through the company's mains daily, with a brief statement regarding the earnings of the company.

Advertisement No. 3: *Readiness to Serve*—Giving the reader the information as to the methods employed in the supply of gas, and how at all times the gas is waiting in the mains ready to respond to the individual needs of the consumer. This advertisement explains just what it means for the gas company to have gas "on tap" twenty-four hours a day and three hundred and sixty-five days in the year.

Advertisement No. 4: *Our Obligations*—An assurance to the consumer of the company's desire to serve him at all times, and the efforts made to fulfill the obligations they feel their customers are entitled to.

Advertisement No. 5: *What We Say to Our Employees*—The statement that employees are instructed that in the eyes of the public they represent the company. Explaining how they are instructed at all times to make courtesy a daily habit, to avoid disputes and assume that the customer is right until facts shall prove otherwise.

Advertisement No. 6: *Gas Without Service*—Gas without service would be of little use, service being the prime essential of a gas utility company; therefore the necessity of a slight service charge.

Advertisement No. 7: *The Reason for the Gas Company*—An explanation of the essential need of the gas company in the development of a community, and emphasizing that this service means progress and prosperity.

Advertisement No. 8: *The Home Comfort Obtained by the Use of Gas*—The desirability of this utility stressed and its conveniences enumerated.

Advertisement No. 9: *The Luxuries of Yesterday Become the Essentials of To-day*—Describing the growth of this essential industry and its transition from a luxury to a necessity.

Advertisement No. 10: *Where Else Can Such Value Be Obtained?*—An explanation of the convenience of gas service and the real money value obtained by the consumer.

Advertisement No. 11: *The Gas Meter*—An explanation of the principles of the gas meter, simple yet scientific. A cut is used with this ad, showing a typical gas meter with top and sides removed.

Advertisement No. 12: *Company. Meter Reading*—The theme of this ad is the ease with which the company reader is enabled to read hundreds of meters daily; from long familiarity with the dials they have become as readily readable as is the watch to others.

Advertisement No. 13: *How to Read the Gas Meter*—A less on gas meter reading, with full instructions, and method of computing approximate bill.

Advertisement No. 14: *How to Test for Gas Leaks*—One of the most important of the series, since with the knowledge obtained from this ad the consumer may be assured of safety and may take steps to correct any leakage found.

Advertisement No. 15: *Explanation of the Term B.t.u.*—A definition of the term, comparing it with a yardstick and describing how a definite amount of heat must be used to raise an object from one temperature to another.

Advertisement No. 16: *Selection and Purchase of Gas Appliances*—Another very important educational feature, since the efficiency of the appliances chosen in large measure governs the satisfaction of the consumer. The three essentials stressed are the use of properly raised burners for the use of short flame service, open tops, and adequate flue connections.

Advertisement No. 17: *How to Adjust the Gas Range*—This text carries a cut more fully illustrating the principle of proper mixture of gas and air for the blue flame resulting from correct adjustment. The text tells in detail how to adjust air intake and gas inlet to obtain this result.

Advertisement No. 18: *Waste from Using Gas in Furnaces Designed for Use of Coal*—This heading is explanatory of the subject of the text, and explains in detail the inefficiency of converting coal furnaces to the use of gas.

Advertisement No. 19: *Burning Gas for Cooking*—A discussion of proper flames for best results, and a description of the three essentials of efficiently burning gas for cooking, viz.: the gas must be properly burned, flame properly directed, and heat properly distributed.

Advertisement No. 20: *Waste from Using Gas Before and After Cooking*—Aimed to teach the consumer to conserve the supply, and serving two purposes: the reducing of the consumer's monthly bill and the conserving of the supply in the mains during the critical times the company is called upon to deliver a peak load.

Advertisement No. 21: *The Proper Care of the Gas Range*—The care of burners, enameled parts and general care explained. Gives attention to the prevention of smoking burners and the consequent soot that renders them inefficient, and the prevention of oven rust, emphasizing that a clean range saves gas.

Advertisement No. 22: *Hot Water Heaters*—Perhaps more gas consumers "go wrong" on the hot water heater than any one phase of gas consumption. The nine hints contained in this ad make for efficiency, safety and satisfaction.

Advertisement No. 23: *Heating with Gas*—Points out the advantages of gas as a heating cedium, its convenience, cleanliness and economy. Stresses efficient appliances, and the installation of some auxiliary heating unit to be used should gas service be interrupted from any cause.

Advertisement No. 24: *Portable Gas Heating Stoves*—A warning against the many so-called odorless, smoke-

consuming, chimneyless heating appliances on the market, pointing out the dangers often attendant upon their use.

Advertisement No. 25: Cheap, Unfit Gas Tubing—Another warning against a common error of the average gas consumer, and an encouragement for pipe connections on all equipment.

Advertisement No. 26: Safety First Warning—Stresses main dangers incident to the use of natural gas; that is, the hazard of the leak either in pipes, fittings or apparatus. What to do if leak is found, and how to avoid danger if odor of gas is detected.

Advertisement No. 27: Our Desire—A carefully worded statement of the company's desires for the consumer, that at all times the service rendered shall be of the best, and how the consumer may help by an intelligent use of natural gas and a proper understanding of the proper use of appliances to eliminate unnecessary waste.

Advertisement No. 28: Our Sincerity in These Advertisements—The expressed wish that the customer has profited by the series about to be concluded, and trusting that he will limit the gas used to his needs, thus making "gas bills" "thrift bills," as well as resulting in a more thorough appreciation of gas service. The statement of the company's creed that their best asset is a satisfied customer, pointing out that the friendly customer with a small bill is more to the advantage of the gas company than the dissatisfied customer with the feeling that he has been overcharged.

Advertisement No. 29: To Aid Us in Serving Promptly—Covers the subject of house piping and fixture tests, and proper method of applying for service pipes, meters, etc.

Advertisement No. 30: We Cheerfully Await Our Opportunity—The final ad of the series, carrying the assurance to the customer of the desire to give satisfactory service. An invitation to discuss gas troubles with the company with a view to eliminating them. The willingness of the Dallas Gas Company to assist the consumer in any possible way.

A glance at the above synopses serves to show the reader the scope of the campaign and the careful planning that was necessary on the part of Mr. Brady to perfect and put over such an excellent series. These advertisements represent a considerable financial outlay and to justify this expense it is necessary that each advertisement in the series meet the requirements of good advertising and shall bring the consumer into a closer understanding and appreciation of the aims of the gas company. And weighed in this light the copy has been well worth while, for never has the Dallas Gas Company been accorded such general approval as at the conclusion of the late campaign.

Low Temperature Carbonization

What Is Being Done in Great Britain

By MAJOR F. JOHNSTONE TAYLOR

Of recent years a good deal of attention has been paid by British engineers and others to the advantages presented by low temperature carbonization. The Smith process now working on a fairly large scale in the United States attracted the attention of British engineers some time back, and the carbocoal plant at Clinchfield, Va., was somewhat fully discussed by the technical societies and in the leading technical papers. In the meantime, of course, the subject had been taken up by several people interested in the gas business and considerable progress has been made by various concerns.

Fuel Research Experiments

The subject of low temperature carbonization is looked upon in England as so important that the Goverament has recently installed at the experimental station for fuel research a plant for investigating the whole question. The report of the work done during 1920-1921 throws some interesting light on the problem. It is obtainable from the Government Stationery Office.

During the war attention was directed in England to the national importance of low temperature carbonization by the fact that if it could be established on a basis that was practicable both technically and economically it would provide an adequate supply of fuel oil for the navy and the mercantile marine. Oils, however, are not all. They form only about 6 per cent of the product. The constituents into which, on the average, low temperature carbonization resolves coal, consists of something over 70 per cent by weight of coke, 9 per cent of gas, and some 6 per cent of fuel oils and motor spirit, besides by-products such as sulphate of ammonia.

Economically the most important of these constituents is the coke. This retains some 8 to 12 per cent of the volatile matter of the coal, and is able to kindle readily and to burn brightly and cheerfully, without producing smoke. This coke is produced at the cost not only of the coal spent in effecting carbonization but also of a reduced producton of gas; and the problem is therefore to determine how this cost can be split up among the products without rendering them unsalable. It was accordingly recognized that an intensive study must be made of the process of coke formation and the report referred to contains an instructive account of the methods adopted and the results attained.

Experimental Work Begun

In the first instance, a new method of coal assay was elaborated to supplement the ordinary analyses. This enabled the laboratory to determine by direct weighing and measurement the yields of the principal products obtained by carbonizing the several coals used, to observe their physical and other products, and to study the behavior during carbonization of different types of coal with a view to preparing not only domestic but metallurgical and other

industrial coke. From the coals investigated the yield per ton of dry coal was from 14½ to 15½ cwt. coke, 13 to 17 gal. crude oil, 7 to 15 gal. liquor, 4½ to 8½ lb. ammonium sulphate, and 3,000 to 3,500 cu. ft. of gas. The coke, when prepared properly from a suitable coal or blend, was strong, hard, and well carbonized. A yield of refined spirit of 1.4 gal. per ton was obtained, 68 per cent of which distilled up to 100 deg. Cent.

The maximum evolution of gas is attained in about two hours after charging, and is continued for about twenty minutes, the highest calorific value is reached a little earlier and falls off gradually as the evolution of gas proceeds. The specific gravity falls uniformly throughout most of the process, the fall becoming small towards the end. This experimental work has succeeded in providing data for designing industrial plant and apparatus.

The steel retorts have been made thoroughly successful, but up to now, though they have produced a large quantity of good coke cakes, the attempts at automatic carbonization have been attended with difficulty. This has arisen principally through the loss of rigidity in steel at 600 deg. and the creeping of parts that for satisfactory working should be kept accurately in register; but the development of the method is being continued with some hope of important results. In the meantime the use of the rich hydrocarbon gas for enriching town gas has established an important link between the gas industry and the new industry of low temperature carbonization, which has also been linked to the metallurgical industry by the results of blending and prebriquetting, and may supply it with coke of a quality and regularity that hitherto has been badly wanted.

Several Methods Feasible

One of the first of the British processes, that of the Low Temperature Carbonization Company, Ltd., known as the "Coalite" process, consists in carbonizing the coal at a much lower temperature than is usual in gas manufacture, that is, about 1,000 deg. Fahr., so as to avoid undue decomposition of the volatile matter to gas, and to leave about 10 per cent of volatile matter in the residual "Coalite." This method is a simple low temperature process, but many of the other processes now coming to the front do not necessarily employ a much lower temperature than the gas works and the coke oven. It is quite impossible to describe in a short article all the various processes of low temperature carbonization that are being, or have been, perfected, but essential features of the most important will be briefly outline.

The Freeman Process.—The "Freeman" continuous carbonizing vertical retort is in four stages or zones, heated by producer gas, the first being for the removal of water from the coal, the second for the transformation of the dried and partially altered coal into a partially soluble condition with the formation of oil, the third for the completion of the carbonization and driving off the oil and other volatile products, and, finally, a cooling zone so that the residual smokeless fuel may be delivered into the air without trouble. The separation of water in the first stage begins at 212 deg. Fahr. and goes on until about 500 deg. Fahr. The second stage commences in the neighborhood of 450 deg. Fahr. and may continue until 650 deg. Fahr., and it is only when the complete transformation of the coal substance has taken place that oil can come off. The third stage is from about 600 deg. Fahr. to about 800 deg. Fahr., depending on the constitution of the coal, and the temperature in the "Freeman" process is not allowed to exceed 800 deg. Fahr.

The Maclaurin Process.—The "Maclaurin" process differs from all other in this respect: that no external heating is required. The vertical continuous retort somewhat resembles a small blast furnace, being 40 ft. high and 8 ft. in diameter at the combustion zone. Raw coal is charged in at the top and slowly travels downward, emerging at the bottom as low-temperature fuel. The carbonization is carried out by the heat produced by means of the combustion of part of the fuel in the bottom of the retort, an air blast being used to assist the process. The hot products of combustion pass up through the retort, carbonizing the coal and driving the volatile matter upward, when it is condensed by contact with the cold coal and withdrawn by means of a specially designed trap. The period of carbonization is twenty hours and the smokeless fuel is formed at a temperature of approximately 1,300 deg. Fahr. It contains about 4 per cent volatile matter, is claimed to be as hard as gray coke, and is as easily ignited as ordinary coal. The resulting product is black in color. The yield by this process from an average coal with 35 per cent volatile matter and 7.7 per cent water is 10.96 cwt. of smokeless fuel, 15.6 gal. of oil and 27,731 cu. ft. of gas at 247 B.t.u. The amount of ammonia is quite small. The oil is of peculiar composition, and contains no light oils or motor spirit. It has a very high percentage, however, of cressols, xylenols and other higher phenols, and the crude oil can be used as fuel oil.

The Neilson or "L. M. N." Process.—This apparatus consists of a long horizontal slowly revolving cylinder into which the raw coal is fed continuously at one end and caused to travel along the whole length of the cylinder, while at the same time being turned over. The heating is by means of producer gas which enters at the other end of the retort and travels in the reverse direction to the coal. The latter emerges continuously at the other end in the shape of low-temperature fuel. The patentees of the process contend that low-temperature carbonization can only be a financial success by having continuous retorts capable of a very large output. Single units of this type are now being constructed capable of handling 100 tons per day. The system is being applied to the production of power gas. The heat from the producer gas is used for carbonizing the fuel, the gas from which is used to enrich the producer gas, which by having its heat abstracted can be stored in a gas holder without detriment to its heating value. The "fusion" retort is also a continuous horizontal revolving cylinder, heated internally by producer gas, the principal feature being a loose star-shaped breaker placed within the inner of two concentric shells, and which, in falling back into place during rotation, gives a series of glancing blows. This breaker has the double object of breaking up the carbonizing material and keeping the heated surfaces of the cylinder free from smale.

The Mond System.—So-called "Mond" gas has for many years been supplied from central stations in the industrial districts in England for use principally in connection with the metal industries. The Power Gas Corporation of Great Britain has developed the Mond

(*Continued on page* 565.)

As the Journal Views It

The Recent Elections

Just what significance, if any, can be attached to the results of the recent elections it is too soon to say, but undoubtedly there is bound to be some reaction on the public utility field. Changes in State governments always are reflected in legislative action, and this election brought into office many who are pledged to changes in laws and regulations covering all branches of public service.

In New York State, where the newly elected governor ran on a platform that contained a plank covering public utilities, it is hard to see just what changes can be made. The Public Service Commission which is now functioning is covered by laws that it will be hard to change, because at this writing it does not appear that his party, the Democratic, will have control of both houses of the Legislature, and this control will be necessary for concerted action in order to make any radical changes.

But when the various State law-making bodies convene we can look for the introduction of bills all aimed at public utilities. Most of these bills will never be passed, it is true, but they will provide ammunition for a certain class of newspaper.

Main Extensions

In various parts of the country there is constantly arising the question of extension of distribution lines to care for new consumers, and controversies sometimes follow as to who should pay for this work. This is particularly true where consumers are located some distance from the mains that are already installed. In some States, it is true, there are fixed rules covering this extension, but even in these localities we find that frequently there are requests made for exception to the fixed practice.

A number of years ago a gas company, realizing that its territory was bound to grow, extended its distribution lines into sections that were only thinly populated and which offered but slim chance of return on its investment for several years to follow. Two reasons animated the move: first, it was felt that the company should be prepared for its ultimate growth; and, second, the price of materials and labor was low enough to allow for the installation without an undue expenditure.

Exactly as there were two reasons for the work there were two criticisms that followed. It was said by those who should have known better that activity on the part of the company was simply to increase its investment slightly so that it could capitalize largely and thus seek an increase in rates from its consumers. The second criticism was that the company was in league with local politicians who would benefit either directly or indirectly from the installation of the improvement.

For years after the installation was completed the company was the target of attacks from all sides and it was accused of all kinds of dishonest practices.

Then came a boom to that community and houses were erected in rapid fashion in this territory. No complaint was heard that the gas company was prepared to care for the needs of the flourishing city. But that gas company is still singled out as an organization that is dishonest and which deserves only short shrift at the hands of the authorities.

There is another angle to that situation, however, which is worthy of consideration. That is that to-day it is being ordered to extend its main in another direction to care for a few consumers who will not consume enough gas in many years to offer any sort of return on the investment. But the authorities are continuing to issue their demands, with threats of legal proceedings unless each consumer is taken care of.

Now, there is a reasonable distance for extending the mains. In some sections this distance is greater than in others, depending entirely on conditions that exist at the time the order is issued. But for a company to be required to install several hundred feet of main at a large cost for labor and material, merely to supply a consumer whose annual consumption will not warrant the expenditure, amounts, in our judgment, to confiscation.

An equitable plan—which, we believe, is in operation in some sections—would be for the consumer to pay some part of the cost, with an adjustment to follow provided the annual consumption reached a previously agreed upon amount. This would protect the company from having to make a large investment upon which it must earn a fair return, and that naturally must come from its sales of gas, forcing up the rates, and at the same time it would educate the consumer as to how the company invests its money.

This subject of main extensions is one that should be carefully studied and recommendations made for the guidance of the entire industry. We recognize that no fixed schedule can be made for the country, but a basis can be found for figuring.

We would be glad to have our readers discuss this question in the columns of the AMERICAN GAS JOURNAL.

Survey of Coal Supply, October 1

Government Issues Statement Covering the Situation

Washington, D. C.—The following statement as to the extent of commercial stocks of anthracite and bituminous coal throughout the country as of October 1 has been issued by Federal Fuel Distributor C. E. Spens:

"A canvass of commercial stocks of anthracite and bituminous coal undertaken by the Bureau of the Census of the Department of Commerce, and the United States Geological Survey, under authority of the Federal Fuel Distributor, indicates that on October 1, 1922, commercial consumers had in storage approximately 28,000,000 tons of soft coal. This figure compares with 27,000,000 tons on October 1, 1916, and with 28,000,000 tons on October 1, 1917. Comparison with 1918 and 1919, the war years, would not be of value. Figures for October 1, 1920, are not available. On June 1, 1920, stocks amounted to 20,000,000 tons.

"On September 1, 1922, stocks amounted to 22,000,000 tons which had increased, as stated, to 28,000,000 tons on October 1, an increase of 27 per cent. The trend of production has continued upward and coal is being added to storage. The increase in storage from October 1 to November 1 is estimated to at least equal the increase from September 1 to October 1, so that, on November 1, 1922, stocks on hand approximated 35,000,000 tons.

"It is not possible to collect statistics of the stocks of domestic consumers, nor of the comparatively small individual steam coal consumers, and the statistics are, therefore, confined to commercial consumers, and does not include coal in the cellars of domestic consumers nor steamship fuel, nor coal on the docks at the head of the Lakes, which is classed as coal in transit.

"On January 1, 1922, commercial stocks amounted to 48,000,000 tons. In anticipation of the strike consumers commenced to stock in January. On March 1 the estimated stocks had grown to 52,500,000 tons and by April 1, when the strike began, to at least 63,000,000 tons. Consumption during the strike, of course, exceeded the production, and by September 1 stocks had been reduced as shown to 22,000,000 tons. The experience of 1920 had indicated that when stocks fall to 20,000,000 tons, high prices and anxiety result, and this experience was repeated in September, 1922.

Decrease in Consumption

"During the six months, March 1 to September 1, 1922, it is estimated that the total consumption and exports of bituminous coal approximated 195,000,000 tons, a slight decrease in consumption as compared with the 1921 average, due to warmer weather, curtailment of operations in some lines of industry and shrinkage of exports. During this same period production and imports amounted to but 152,900,000 tons, leaving a deficit of 42,100,000 tons, of which 30,500,000 tons was drawn from consumers' stock, and the balance, 11,600,000 tons, from coal in transit.

"The average weekly production at present is approximately 10,500,000 tons or, roughly, 2,000,000 tons in excess of current consumption.

"Expressing stocks in terms of days' supply and divided as between various classes of consumers, based on current rate of consumption at time of stock taking (incomplete data being estimated), the situation on October 1, 1922, compared with September 1, 1922, was as follows:

	Sept. 1	Oct. 1
By-product coke plants	11	14
Steel plants	10	17
Other industrials	32	37
Coal gas plants	34	38
Electric utilities	26	30
Coal dealers, bituminous	11	19
Railroads	13	15
Total bituminous	17	22

"Since October 1 stocks have continued, as stated, to increase still further.

"Since the anthracite production this season will probably not much exceed 60 per cent of that of last year, consumers must find substitutes for the deficit and, therefore, stocks of retailers in the anthracite consuming territory must be reckoned in terms of all coal on hand, anthracite and bituminous.

"Reports of anthracite in yards of retail coal merchants, based on advices received from approximately 500 dealers, indicate stocks on hand on September 1, 1922, were less than 10 per cent of stocks on hand on August 1, 1921. From September 1 to October 1, 1922, stocks increased slightly but were still barely 15 per cent of those at the corresponding season last year. However, during the month of September, on account of the strike, there was only about a two weeks' production. The production in October was large compared with previous years of 1920 and 1921, and so the condition on November 1 was undoubtedly somewhat better.

Retailers' Stocks

"The stocks of retailers, including both hard and soft coal, on October 1, 1922, showed a decrease of 67 per cent as compared with the stocks on November 1, 1921. In the State of California there was an increase; no change in Washington, Oklahoma and New Mexico; a decrease less than 25 per cent in Oregon, Nevada, Arizona, Nebraska, Minnesota; a decrease of 25 to 49 per cent in Montana, Idaho, Colorado, Mississippi, South Carolina, Maine, New Hampshire and Maryland; a decrease of 50 to 74 per cent in Utah, Wyoming, North Dakota, Illinois, Iowa and Missouri, Louisiana, Alabama, Georgia, New York, Massachusetts, and Connecticut; and a decrease of 75 per cent and over in Kansas, Missouri, Michigan, Indiana, Ohio, Pennsylvania, Kentucky, Virginia and West Virginia, and Vermont.

"It will be noted that, generally speaking, the coal producing States show the greatest decrease, indi-

cating the movement of coal to non-producing States, with subsequent opportunity to care for local needs. The increased production, permitting of increased reserves in October, has also served to modify these percentages as of November 1, 1922.

"At the actual rate of consumption in September, stocks necessary to avoid curtailment of operations at industrial plants—other than steel and by-product coke—on hand on October 1 would suffice for thirty-seven days, the supply varying from State to State, as follows:

Stocks by States

"Less than thirty days—California, Nevada, Texas, Kansas, Nebraska, North Dakota, South Dakota, Iowa, Illinois, Louisiana, Alabama, Florida, Kentucky, West Virginia, Pennsylvania, Maryland and Delaware.

"Thirty days and less than sixty days—Washington, Oregon, Idaho, Nevada, Wyoming, Colorado, New Mexico, Minnesota, Wisconsin, Missouri, Arkansas, Mississippi, Michigan, Indiana, Ohio, Kentucky, New York, Virginia, Tennessee, North Carolina and Georgia.

"Sixty days and less than thirty—Montana, Oklahoma, South Carolina, Maine and Connecticut.

"Ninety days and over—Arizona, New Hampshire, Vermont, Massachusetts, Rhode Island and upper peninsula of Michigan.

"In comparison with September 1, 1922, stocks on October 1 show an increase in almost every State, except for the South Atlantic and Gulf Coast districts."

Return to Posts

The fifteen naval officers designated to act as field representatives of the Federal Fuel Distributor in as many districts into which the territory east of the Mississippi River has been divided for administrative purposes in connection with the present coal emergency have resumed their duties at their respective posts, following a conference with Federal Fuel Distributor Spens in Washington Saturday, Nov. 4. At this conference reports were to the effect that coal prices were generally easier. The car supply situation remains a troublous problem, various Southern railroads complaining particularly regarding the failure of connecting lines to return coal-carrying equipment. This particular situation, however, seemed to be improving. Use of some open-top equipment for the transportation of stone, sand and other building material was reported, and it was stated that this diversion of coal cars was being investigated by the Federal Fuel Distributor. Individual priorities for the movement of coal, the naval officers were advised, have been almost entirely eliminated. The cooperation of coal operators with the administration's field representatives was being obtained quite generally in the various fields, it was said.

Conferences on the matter of coal prices will probably be held by the Federal Fuel Distributor in Washington within the next few days with representatives of the operators from the Ohio, Indiana, Illinois and western Kentucky fields and the Kanawha and Logan fields of West Virginia.

Low Temperature Carbonization

(*Continued from page 562.*)

gas process, which is now essentially a combination of L. T. C. and the original Mond system. In this process raw coal is heated in a special producer and treated with a very large amount of steam, the yield from 1 ton of average coal which required a net amount of 1¾ tons of steam being 135,000 cu. ft. of gas, 85 to 95 lb. of ammonia sulphate, and a small amount of tar. The latter is of no value. In the new process the producer has been considerably altered so as to give a heat treatment to each particle of the coal for a much longer period, the result being that L. T. C. takes place in the upper zone of the producer by means of the sensible heat contained in the hot producer gas generated in the lower zone. The volatile products of this L. T. C. are collected as usual, the residual fuel being then converted completely into producer gas in the lower portion. The high yield of ammonia sulphate characteristic of the original process still remains. The amount of steam required, however, is about 75 per cent less; the yield of gas is practically the same but of higher calorific value—that is, 178 B.t.u. as compared with 140 B.t.u.; while there are 15 to 20 gal. of tar and 90 lb. of ammonia sulphate yielded by 1 ton of coal. The average composition of the gas is stated to be 21 per cent CO, 20.5 per cent H, 8.3 per cent CO_2, 4.9 per cent methane and 45.3 per cent N. The exponents of the system claim that it unites most of the good qualities of L. T. C. and the orthodoz Mond process.

Use of Pulverized Coal

A system invented by Sutcliffe & Evans consists in pulverizing the coal and mixing it with 20 per cent of pulverized coke breeze. This mixture is then briquetted under 10-ton pressure, forming a hard briquette without binder. These briquettes, which are of pure coal only, are then carbonized in a retort internally heated with producer gas at a comparatively high temperature; about 1,600 deg. Fahr., in fact. They have the peculiar property of not expanding during carbonization, so that a simple vertical cylinder can be used as a retort and several hundred tons can be carbonized at a time in one unit. The residual smokeless fuel only contains about 2 per cent of volatile matter, but is easily ignited like raw coal. This is due to the peculiar fine grain structure of the fuel, which under the microscope is stated to resemble charcoal. The yield per ton of average coal by this process is claimed to be 14 cwt. of residual fuel, 10,000 cu. ft. of gas having a calorific value of 550 B.t.u., 20 gal. of oil, about 3 gal. of motor spirit, and 30 to 40 lb. of sulphate of ammonia.

"Gas Companies Sell Gas and Also Service"

Gas companies must be prepared at all times to render service.

You expect to have gas ready and waiting to meet your instant demand, day or night, if only for two or three cubic feet.

Every other patron of the company naturally wants the same kind of service. You want gas to be ready, just outtside your meter, for your instant use at any time, even if you only need it once or twice a week.

In order to be able to render such a service, the company must make just as big an investment as if you were to use gas the full twenty-four hours a day.

Making the Most of the Coal Shortage

How the Providence Gas Company Has Handled the Situation

By J. E. BULLARD

There is very little question about there being a more or less critical coal shortage this year. The people have already been prepared to do the best they can with any fuel that they can get. They are willing to listen to and read instructions in regard to the proper burning of the experimental fuel that they use.

There is very little question about the gas companies being able to dispose of all the coke that they have to sell. The Providence (R. I.) Gas Company is so certain that it will not have enough coke to supply the demand that it has mailed postcards to its customers asking them to answer three questions. These cards read:

> Dear Sir:
>
> In the fuel emergency it is our purpose, so far as possible, to take care of our regular customers for Providence domestic coke.
>
> To assist us in determining their needs will you kindly fill in the blank spaces below and mail this card to us before Sept. 25:
>
> When did you order coke last?.....19..
> How much fuel have you on hand?.....tons
> How much more do you require?.....tons
>
> Name .....
> Address .....
>
> This card will not be accepted as an order and is not transferable.

There is good selling psychology in this card. It infers that there is such a demand that it will be necessary to ration the supply, and this inference in itself is certain to create a greater demand for the coke than would otherwise be the case. If these cards had not been mailed, a number of the old customers might have taken it for granted either that they will be able to get all the coke that they will need and there is no hurry about ordering, or that there will be a severe coke shortage this year and they had better order some coal, as well as coke, in order to play safe and have all the fuel that they need. It is pretty certain that some people will order all the different kinds of fuel on the market so as to feel sure they will get enough of one kind or another to keep warm during the winter. Already a good many people have ordered firewood who have not been in the habit of using any to speak of in the past.

A postcard like the one the Providence Gas Company is mailing out is reassuring to the old customer and tends to build good-will for the gas company. However, merely providing the customers with the fuel is not enough if the most is to be made of the coal shortage.

As has already been stated, the people are now in the state of mind where they are willing to listen to and follow instructions. They are anxious to make the fuel go just as far as they can. They will go to more trouble this winter than they have for a long time, and than they will for a long time to come, to try to burn the fuel they buy in the best possible manner.

Opportunity for Building Good-Will

This state of affairs offers the gas company a great opportunity for good-will building and for creating a permanent domestic market for coke. There are not very many domestic users of fuel who know how to burn it. It matters not what kind of fuel they have been burning—whether it has been anthracite or bituminous coal, or coke—they have been sending a great many more of the heat units in that fuel up the chimney than it is necessary to send out-of-doors. If all householders could be trained to get the very best results from the fuel that they burn, it is conservative to estimate that the fuel consumption of domestic fuel would be reduced by at least 25 per cent. This holds true even of gas.

Anyone who has studied the gas bills of gas consumers and the results these consumers are getting from the fuel burned has learned that there is a tremendous difference in the consumption for the same results obtained. One family will use double the amount of gas that another family of the same size, and using gas for the same purposes, uses. The difference in the consumption is not due to any difference in what is done with the gas or in the appliances. It is due solely to the way the gas is burned.

The same holds true in regard to solid fuel. In 1908 the writer was engaged in giving coke-burning instructions to the people in Detroit, Mich. He found that by teaching some of the people how to burn coke they were able to heat their homes far more satisfactorily than they had ever been heated before and with considerably less fuel. It was just a matter of teaching these people how to burn the fuel they were buying. They did not know how to burn any kind of fuel. After they had been taught the proper method of burning coke they could not get satisfactory results from any other form of fuel.

Teaching Them How to Burn Coke

This winter all gas companies have a wonderful opportunity to teach people how to burn coke. Back in 1908 a great many people would not really take the trouble to learn how to get the best results from the fuel that they bought. It was so cheap that all they cared about was in burning it in such a manner as to get the heat that they needed. A ton or more during the winter was of little consequence.

This winter conditions are different. There is not a certainty that it will be possible to get that ton or two extra if it is needed. The problem is to make each ton bought go just as far as it will. Accordingly, if the gas company will send a demonstrator to each of the pur-

chasers of its coke and will have this demonstrator continue to coach that customer until he gets the very best results from the coke burned, it is going to come about that the coke users are going to average fewer tons of fuel for heating a given number of rooms than will the users of any other kind of fuel.

Of course, it is not necessary to do this in order to sell all the coke that can be supplied. However, next summer people are going to compare results. If coke doesn't show up very favorably in comparison with other fuels, then it is going to be more difficult to sell coke the winter following this one. If it is possible to teach each coke user to burn his coke in such a manner that he makes a ton of coke go farther than his neighbor makes a ton of hard coal or of soft coal go, then that neighbor will be inclined to buy coke when he puts in his next winter's supply of fuel.

It cannot be too strongly emphasized that the way the gas companies handle the sale of coke this winter is going to have a great deal to do with the good-will that they create for themselves and with the future market for coke. If hard coal shows better results than coke in the average home, or if soft coal shows better results than coke, then it will be these fuels that people will want when they can pick and choose. If coke shows better results than any other form of fuel used, then not only will those who buy coke this winter because they can't get any other fuel buy it next winter, but they will urge their friends to do likewise and the demand for coke will at least equal the supply.

Laying a Foundation

There is reason to believe that there is a possibility for every gas company having coke for sale to lay the foundation this winter for a coke demand that will be so great that people will be willing to pay at least as much for coke as they are for any other solid fuel. It may be possible to create a demand so great that a dollar or so a ton more for coke still leaves it at a price that makes it an economy for the people to buy.

Much depends upon the way the gas company handles the situation. It all depends upon how successful it is in teaching the people how to burn coke. They are already reading fuel-burning directions that appear in the newspapers and they are reading them with a great deal of interest. They are not all going to get the best results from the attempts to follow these directions. There is only one way to show people the very best method to get the most out of the fuel that they burn, and that is by calling at their homes and demonstrating to them just how to burn it. There are too many exceptions to make general instructions entirely satisfactory. The drafts of different chimneys vary. Different furnaces and household steam and hot-water boilers are in different conditions. Sometimes some slight and inexpensive change will have to be made in the heating system before satisfactory results can be obtained. A hot-air furnace heating system was found in Detroit, for example, where the joints in the hot-air pipes were all open. After the piping was put together and the open spaces in it were closed, that householder got results. There are a lot of little things like these that the householder ought to notice, but which apparently he does not. It requires the visits of a demonstrator to point them out. The sale of coke this winter does not require the services of these demonstrators. If coke is to be sold in satisfactory quantities next year, however, and at satisfactory prices, it is necessary to employ demonstrators this winter. The money that is saved next year in selling costs and the additional price at which it will be possible to sell coke will much more than cover all the additional costs to which gas companies go this winter in demonstrating to people how to burn coke.

Industrial Gas a Personal Matter to Her

By Calvin Lindley

Getting the housewife to take sides with you in a campaign to sell more gas for industrial uses, and more coke too, is an achievement of the Peoples Gas Light & Coke Company, of Chicago. It is also an example in persistency. The different ways in which the housewife is constantly reminded that she is very much concerned about the adoption of industrial gas and coke is a study in resourcefulness.

What has a woman to do with gas for industrial purposes? Well, the old soft-coal methods make lots of smoke. And if there are lots of smoke, how is a woman going to hang her washing out where it can dry in the wind and sun? And there certainly is one large army of women who take pride in white clothes that have been "hung out." Chicago is less of a tenement city than a city of homes, so there is plenty of clothesline room.

The average Chicago woman can't get away from the attack made by the gas company against smoke and soot. Her gas bill comes in and with it the *Gas Gazette*. On the first page she sees, "What Smoke and Soot Cost Chicago." The words "laundry bills" catch her eye. She learns:

In Chicago, average cost of laundry per person per year is $3.25.

In Philadelphia, average cost of laundry per person per year is $2.01.

Therefore it costs each person in Chicago $1.24 more each year.

"But this is only a part of the everyday citizen's personal loss on account of smoke. A shirt or collar will wash just so many times. If our laundry bills are 50 per cent higher than those in Philadelphia, then it must follow that our expenditure for linen that goes to the laundry is also 50 per cent higher.

"Also about the linen that is washed at home. It, too, gets soiled sooner, is more frequently and vigorously washed, and consequently wears out sooner than would be the case in a smokeless city. Clothes that have to be dry-cleaned also need more frequent attention, and so add to the damage bill."

Not only clothes but health is treated, and the frequent cleaning of the big white buildings like the Wrigley Building is cited as a reason for the use of gas and coke.

She goes down to the gas company's main or branch office to pay her bill and while there gets an attractive sixteen-page booklet which says on the colored cover, "You Pay the Damage." Evidently that means her. So she reads it on the street car going home. She finds the same story told in different words and made interesting by illustrations. Each idea is elaborated upon more fully than she had found it in the *Gas Gazette*. The booklet builds up a strong case against soft coal—backed by facts and figures—and inevitably leads to the conclusion that industrial gas and coke would eliminate much of the nuisance, not to say peril.

Then, there was the evening that Willie tuned up the radio so as to get WBU, the municipal station, and they heard the chief gas tester of the city talk on the wonders of gas. They heard this speaker tell again how the laundry costs in Chicago were unduly high and that when the use of gas become more general all these conditions would disappear.

Later she gets a copy of this talk printed in an attractive booklet form at the gas company store. When she and her neighbor compare notes the next morning on their washings they recall some of the things said about soft-coal smoke and how gas and coke would prevent them.

The next issue of the *Gas Gazette*, which comes in the envelope with her gas bill, gives the first page to a story of Chicago's Art Institute. She has been there—when relatives came from out of town—and reads of the beauties there and the size of the building. And in the last paragraph she finds:

"The beauty of this structure is not alone confined to the interior, although at present the exterior is defaced by soot and smoke. Ours is not a 'smokeless town,' and the north facade of the Art Institute, cleansed by recent storms, contrasts sharply with the rest of the building. Perhaps the clean side of the institute indicates a vision of Chicago when our buildings and our people will not be defiled with soot and smoke; when real cleanliness will prevail; when we will burn coke and gas and no longer be termed the 'smoky city.'"

At every opportunity the gas company talks to the women about the dirt due to the smoke and how gas and coke can prevent it. Such a campaign cannot change conditions overnight, but do you know of any more effective way of ultimately having the dirt abolished than by enlisting the women on your side?

Regulation Stifles Growth, Says McMahon

Tells Natural Gas Men Capital Wants Reasonable Freedom

In his message to the oil and gas men attending the convention of the Ohio Gas and Oil Men's Association at Columbus, Ohio, President J. W. McMahon spoke, in part, as follows:

"The natural gas industry is special in that it must come to an end; natural gas is unregenerative; when once used it is not restored, nor can it be replaced.

"Our organization has in the past years observed the warnings of the United States Government survey—has recognized the warnings of our own experts—and has come to realize that time is a measure to all things; that Nature's great storehouse of West Virginia, from which we have drawn so largely since our own Ohio gas fields have been depleted, must approach exhaustion. This last year has marked the realization that our great business of supplying natural gas—and in a large measure, in so far as Ohio is concerned, supplying oil—a business which has been our common pride, is soon to take its place in history.

"We may all have a measurable pride in the high standards which have existed in our business, and particularly in our relations with the public. The history of it will reflect credit upon almost all that have been connected with the business.

"Our State has most highly perfected regulatory machinery which has been created and developed mostly in response to situations that have arisen throughout many years and in every part of the State. When the gas business first developed in Ohio, it was to supply a demand which increasing population has created and because of the presence of gas in parts of Ohio. This industry was not an interloper; it held itself out to public service in an attempt to supply the need for fuel and light. For a time—a considerable time—we were honored guests, more or less dependent on our own sense of honesty and fairness. In justice to the great number of people who guided the destinies of sundry gas companies in those early days, it must be acknowledged that they fully lived up to the responsibilities and that no legal sanction was necessary, in most instances, to secure, in so far as those particular companies were concerned, fairness and impartiality in dealings with the public, as well as efficiency within the limits of those days in supplying public needs. The pioneers in our industry who thus came as guests of the great State of Ohio, many of them from other States, risked large sums of money; took the chance involved in the exploration of Nature's storehouse and installation of magnificent plants to an extreme that those who were not familiar with the situation at that time can little realize. Very early, gas from Ohio was being exhausted and millions were risked in the successful venture of piping gas from West Virginia.

"The great investment that had been made, pipe lines that had been laid, plants that had been installed at great expense, had become permanent investments, practically immovable. Although the public had become in a measure dependent upon them, the gas companies had become utterly and totally dependent for their safety and future upon the sense of fair play of the communities into which they had come. The need of encouraging the investment of capital into these enterprises had passed.

"Had the money that has been put into gas enterprises been put out at 5 per cent interest on mortgage loans, practically every company in Ohio would to-day be in far better financial situation at its approaching dissolution than at present, and would have had no risk and no concern with worry.

"We note these things not out of any spirit of self-interest, because the years that remain for our business are few. From them the public may learn the great lesson that the spirit of development must have its incentive. It is a safe venture that hardly a public utility of any size has newely developed in Ohio since the States assumed the supervision and control. It may be that none was needed, and the explanation may be quite aside from relation to this instiution. It more probably is, however, that capital will not pioneer without its freedom and finds this freedom in other unregulated fields.

"I trust there may be found and developed out of the wisdom and experience that is available among the members of this association some concrete suggestion that will be of benefit to the State and to us in solving the problems that have confronted us and that will be of benefit to the good people of our State, our friends and neighbors whom we have so long endeavored to serve, and who, after all, are closer to us, despite whatever little differences of opinion we may have had, than any others."

The activities of the Ohio Gas and Oil Men's Asso-

ciation will be under the direction of the following capable officers: President, H. J. Hoover, Cincinnati, Ohio; vice-president, T. C. Jones, Deleware, Ohio, and E. F. Clagget, Columbus, Ohio. Directors: J. W. McMahon, Toledo; J. M. Garard, Columbus; Ira L. Neely, Wooster; Martin B. Daly, Cleveland; Warren E. Burns, Marietta; George W. Trimble, Lancaster; James Burtner, Wooster; T. J. Jones, Columbus, and John B. Klise, Lancaster.

Better Methods of Using Natural Gas

Many Improvements Have Been Made in the Economical Uses of Natural Gas

There have been decided improvements in the use of natural gas in the industries during the past few years. These improvements have been brought about partly by improved devices—burners and furnaces—and largely by more scientific combustion control and methods of heat application:

With natural gas at 15 cents per thousand cubic feet, there was little need for particular care in the use of gas. It was cheaper, in most cases, than other fuels even when used wastefully. However, as the price of gas has increased, it has not lost this advantage, but more care must be taken in its use.

At about 20 cents coal became a competitor for boiler purposes. At about 25 cents cheap oil became attractive. Now with gas at 40 cents, 50 cents, and higher in many places, we must not be led to believe that gas is too expensive for industrial operations.

Companies whose systems have been installed large enough to take care of industrial business, must retain a considerable industrial load in order to permit their operations to be profitable. It will be necessary to co-operate with the industrial consumers, to show them how gas can be burned economically, and to help them select and improve furnaces and burning equipment.

The manufactured gas companies have been doing this for some time. They are able to compete, with city gas of 550 B.t.u. at 90 cents, against oil at 5 cents per gallon and coal at $4 per ton, for vitreous enameling. With a 565 B.t.u. gas at 90 cents, they have been able to compete against 6-cent oil and $6 coal for bright annealing copper wire. With a 600 B.t.u. gas at $1 they have taken forging work away from oil at 8 cents on a fuel cost basis alone. In bake ovens and for coffee roasting, 600 B.t.u. city gas at $1.25 per thousand has gotten the business in place of coal. Manufactured gas companies everywhere are selling their gas for brass melting, heat-treating and many other industrial uses.

Real Value of Natural Gas

Manufactured gas of 565 B.t.u. per cubic foot at 90 cents per thousand cubic feet is about equivalent to 1,000 B.t.u. natural gas at a price of $1.60 per thousand cubic feet. Natural gas rates everywhere are still very much lower than this.

From the agove illustrations it is evident that a comparison of gaseous fuels with solid or liquid fuels on a B.t.u. basis alone is not correct. Very evidently, the fuel cost is not the only factor which will determine the fuel to be used. The methods of burning the gas and of applying the heat have a very important bearing. Similar methods must be adopted where natural gas is the fuel used.

Just to show what has been done in some of the plants in and about Pittsburgh and what can be done in many other plants, a few instances of fuel consumptions are cited:

Operation—Melting brass, bronze, copper, aluminum in No. 40, No. 60, No. 80 and No. 100 crucibles.

Previous methods—Coal-fired pit furnaces.

Previous cost—88 cents per 100 lb. with coal at $8.

Present method—Converted pit furnaces with Maxon burners.

Present cost—34 cents per 100 lb. with artificial gas of 620 B.t.u. at $1 per thousand.

Remarks—Previous capacity, three heats per furnace per day; present capacity, six heats per furnace per day; crucible life, about twenty heats with both fuels.

Operation—Brass melting in crucible furnace.

Previous method—Gas burned with ordinary burner in square furnace.

Previous cost—325 cu. ft. of gas per 100 lb.

Present method—Gas in redesigned furnace using Premix burner.

Present cost—275 cu. ft. of gas per 100 lb.

Remarks—Time per heat reduced fifteen minutes; saving accomplished largely by change in shape and design of furnace, location and size of vents and location of burners.

Operation—Glass making.

Previous method—Gas for fuel in 50x76 in. day tank, with long flame using stack draft.

Previous cost—70,000 cu. ft. of natural gas per melt.

Present method—Surface combustion method applied, using pressure air and eliminating stack.

Present cost—38,000 cu. ft. of gas per melt.

Remarks—Melting period shortened from thirty hours to twenty-two hours.

Operation—Glass melting.

Previous method—Using sixteen-pot tank with recuperators for air.

Previous cost—375,000 cu. ft. per melt.

Present method—Recuperators entirely eliminated, gas and air premixed.

Present cost—Fuel cost approximately same.

Remarks—Time per complete melt reduced from forty hours to thirty hours.; maintenance of regenerative checkers eliminated.

Operation—Continuous bottle annealing lehrs.
Previous method—Ordinary pipe burners in cross ducts.
Previous cost—15,400 cu. ft. of natural gas per lehr per day.
Present method—Surface combustion burners in place of pipe burners.
Present cost—28,700 cu. ft. of gas per lehr per day.
Remarks—Method of firing changed from cross ducts under lehr pans to firing near arch.

Operation—Forging sixty-inch by nine-foot ingots at 2,350 deg. Fahr.
Previous method—Square furnace, gas-fired, with regenerators, using fan for air and steam for distribution.
Previous cost—1.7 cu. ft. per pound of metal.
Present method—In circular furnace, without regenerators or steam, using one Premix burner.
Present cost—1.5 cu. ft. per pound of metal.
Remarks—Waste heat recuperated by preheating material in second furnace; production increased 50 per cent; furnace construction and method of applying heat important.

Operation—Open hearth steel furnace.
Previous method—Usual practice. Gas and air mixed in melting chamber and burned with long flame.
Present cost—6,000 cu. ft. of gas per ton of steel.
Present method—Positive pressure on both air and gas. Both pass through same port, resulting in premixing and short flame.
Present cost—3,900 cu. ft. of gas per ton of
Remarks—Fuel cost reduced, capacity increased, life of furnace increased checker troubles minimized.

Operation—Firing pottery.
Previous method—Tunnel type kiln with partial recuperation.
Previous cost—80,000 cu. ft. of gas per twenty-four hours.
Present method—Using recuperated air and premixing gas and air.
Present cost—60,000 cu. ft. of gas per twenty-four hours.
Remarks—Time of putting car through tunnel decreased from two hours and twenty minutes to one hour and ten minutes; method of burning gas most important in this case.

Operation—Sheet bar heating furnaces at 1,500 deg. Fahr.
Previous method—Pipe nipple burners introduced through holes in brickwork.
Previous cost—1.04 cu. ft. of natural gas per pound of sheet bar heated.
Previous method—Old burners replaced by surface combustion low pressure burners.
Present method—Old burners replaced by surface combustion low pressure burners.
Present cost—0.81 cu. ft. of gas per pound of metal.
Remarks—No changes made other than change in burners.

Operation—Carbonizing of tools.
Previous method—Packing material in carbon-containing material and heating in rectangular furnace.
Previous cost—Average of about 7 cu. ft. of gas per pound of metal.
Present method—Material in rotating cylindrical furnaces, externally heated. Natural gas used as carbonizing agent.
Present cost—Average of about 6 cu. ft. of gas per pound of metal.
Remarks—Present method requires much less time, eliminates labor of packing and unpacking material, and gives a more uniform product; depth of case can be easily controlled by changing time material is in furnace.

Operation—Continuous car bottom sheet annealing furnaces.
Previous method—Gas fired with home-made pipe burners.
Previous cost—2,700 cu. ft. of natural gas per ton of sheets annealed.
Present method—Old burners replaced by surface combustion burners.
Present costs—2,340 cu. ft. of gas per ton of metal.
Remarks—No change made in furnace construction.

Operation—Baking bread in Peterson coal type oven, size 10x12 ft.
Previous method—Atmospheric burners in combustion chamber.
Previous cost—76 cents per 1,000 loaves with natural gas at 46 cents per thousand.
Present method—Blast burners installed in combustion chamber. Baffle wall added.
Present cost—52 cents per 1,000 loaves with gas at 46 cents per thousand.
Remarks—Improved heat control resulted in more uniform product, which is considered more important than reduction in fuel bills, in this case.

Three Important Conditions

In order to get the best results at the lowest cost, several conditions are necessary:

1. The gas must be completely burned; that is, there must be no carbon monoxide in the flue products. This requires that sufficient air must be mixed with gas, that this mixture be intimate, and that the mixture be kept above the ignition temperature until combustion is complete.

2. There must not be too much air. Exery bit of extra air coming in at room temperature robs the furnace of a part of its heat.

3. The temperature of the exit gases must be kept low as possible, but it must not be kept low by excess air. Just to show the importance of this: Even with perfect combustion, at a flue temperature of 1,000 deg. Fahr. 30 per cent will be lost up the chimney, while with a flue temperature of 3,000 deg. Fahr. 80 per cent will be thus lost. We find that a flue thermometer and Orsat's apparatus will give very valuable indications of the efficiency of heating operations.

There are now very good burners and burning systems on the market which will help to obtain correct proportioning of air and gas. Some operate automatically to maintain these proportions. But merely a high burning efficiency is not enough. After the maximum heat is generated, this heat must be applied economically and in such a manner as to give the best results. Method of placing burners, design of the furnace, and arrangement of flue exits are all very important.

It is always necessary to exhaust the combustion products at temperatures higher than the temperature to which the material is to be heated. Where these temperatures are high or the furnaces are comparatively large, it has been found advisable in many cases to install recuperators or regenerators. In these chambers the incoming air or gas, or both, recover a large part of the heat which would otherwise be lost, thereby lowering fuel costs.

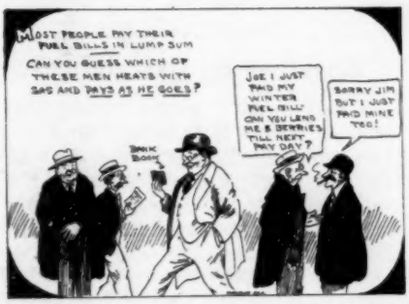
As rates advance, better methods of using gas will need to be applied. Wasteful methods must be eliminated. It will pay every company to make a study of the modern methods which can be used and to help its industrial consumers put them into effect.—Abstract of paper before Natural Gas Association of America, from *Natural Gas.*

"Say It With Pictures"

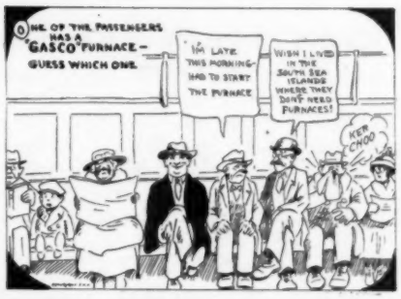
How to Get the Attention of Busy Readers to Advantages of Heating with Gas

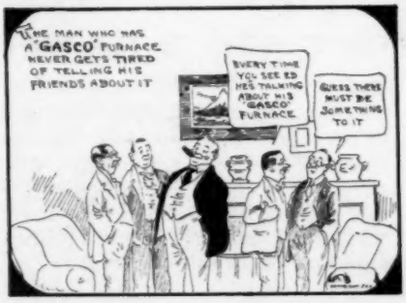
The accompanying cartoons were published recently in the newspapers of Portland, Ore., but in enlarged size, being three columns wide, and the bottom one four columns. A well known Pacific Coast cartoonist was engaged to execute the ideas as submitted to him in rough sketch. The value of these cartoons in arresting the attention of busy readers and impressing upon them the advantages of gas heaters will be immediately apparent.

A HARD DAY AT THE OFFICE
ON HIS WAY HOME... WONDERING HOW THE FOLKS ARE
DREADS TO THINK ABOUT BASEMENT CHORES
PEELS OFF HIS COAT PREPARATORY TO STOKING FURNACE
WIFEY INFORMS HIM THEIR "GASCO" FURNACE HAS JUST BEEN INSTALLED
OH-H-H-BOY! AIN'T IT A GR-R-R-AND AND GLOR-R-R-IOUS FEELIN'
TA-TATA TYA
APOLOGIES TO BRIGGS


MOST PEOPLE PAY THEIR FUEL BILLS IN LUMP SUM
CAN YOU GUESS WHICH OF THESE MEN HEATS WITH GAS AND PAYS AS HE GOES?
JOE I JUST PAID MY WINTER FUEL BILL CAN YOU LEND ME 5 BERRIES TILL NEXT PAY DAY?
SORRY JIM BUT I JUST PAID MINE TOO!
BANK BOOK

GOING TO WORK— ONE MAN HAS A "GASCO" FURNACE. CAN YOU GUESS WHICH ONE?
MY FURNACE WENT OUT AND I GOT CHILLED THROUGH—COULDN'T GET THE BLAMED THING GOING


ONE OF THE PASSENGERS HAS A "GASCO" FURNACE— GUESS WHICH ONE.
I'M LATE THIS MORNING— HAD TO START THE FURNACE
WISH I LIVED IN THE SOUTH SEA ISLANDS WHERE THEY DON'T NEED FURNACES!
KER CHOO


THE MAN WHO HAS A "GASCO" FURNACE NEVER GETS TIRED OF TELLING HIS FRIENDS ABOUT IT
EVERY TIME YOU SEE ED HES TALKING ABOUT HIS "GASCO" FURNACE
GUESS THERS MUST BE SOMETHING TO IT

WHAT'S COME OVER OLD MR. BLUE? HE USED TO BE THE GROUCHIEST MAN IN TOWN
DIDN'T YOU HEAR? HE BOUGHT A "GASCO" FURNACE— NOW HE ALWAYS WEARS A SMILE!

Public Utilities Securities Market Report

Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

Company		Maturity	Nov. 9, 1922 Bid	Asked
American Lt. & Trac. Co.	Five Year 6s	May 1, 1925	110¼	111
Brooklyn Union Gas Co.	First Consol. 5s	May 1, 1945	96¾	97¼
Columbia Gas & Elec. Co.	First 5s	May 1, 1927	95	96
Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore	First Ref. 7½s	Dec. 1, 1945	110	111
Consol. Gas, Elec. Lt. & Pr. Co.	General 4½s	Feb. 14, 1935	92	93½
New Amsterdam Gas Co.	First Consol. 5s	Jan. 1, 1948	85½	87
Denver Gas & Elec. Co.	Gen. (now 1st) 5s	May 1, 1949	95¼	96¼
Detroit City Gas Co.	Gold 5s	Jan. 1, 1923	100	—
Equitable Illum. Gas Lt. Co. of Philadelphia	First 5s	Jan. 1, 1928	99½	102
Hudson County Gas Co.	First 5s	Nov. 1, 1949	92	—
Laclede Gas Light Co.	Ref. & Ext. 5s	Apr. 1, 1934	92½	95
Louisville Gas & Elec. Co.	First & Ref. 7s	June 1, 1923	100	100¾
Michigan Light Co.	First & Ref. 5s	Mar. 1, 1946	92	93½
Milwaukee Gas Light Co.	First 4s	May 1, 1927	93⅜	94
Pacific Gas & Elec. Co.	Gen. & Ref. 5s	Jan. 1, 1942	92	92¾
Pacific Gas & Elec. Co.	First & Ref. 7s	Dec. 1, 1940	106½	—
Cal. Gas & Elec. Corp.	Unif. & Ref. 5s	Nov. 1, 1937	95	95¾
Peoples' Gas Lt. & Coke Co.	Refunding 5s	Sept. 1, 1947	93½	94¼
Chicago Gas Lt. & Coke Co.	First 5s	July 1, 1937	96	97
Portland Gas & Coke Co.	First & Ref. 5s	Jan. 1, 1940	92¾	93¾
Seattle Lighting Co.	Refunding 5s	Oct. 1, 1949	85	87
Southern California Gas Co.	First 6s	Nov. 1, 1950	99	100½
Utica Gas & Electric Co.	Ref. & Ext. 5s	July 1, 1957	91¼	—
Washington Gas Light Co.	General 5s	Nov. 1, 1960	95	96
Western States Gas & Elec. Co. of California	First & Ref. 5s	June 1, 1941	92	94

$25,000 Bonus Offered for Gas at Tyler

Tyler, Tex.—Directors of the Tyler Chamber of Commerce have offered Bell & Arnold, of Shreveport, a bonus of $25,000 to secure natural gas for Tyler from the Panola County fields. The Shreveport firm was given ten days' time to consider the proposition.

Louisville Gas & Electric Earnings Increase

Prominent among the public utility companies that continue to show steady increases in earnings is the Louisville Gas & Electric Company, one of the operated public utility properties of the Standard Gas & Electric Company. Gross earnings of the Louisville Gas & Electric Company in the twelve months ended Sept. 30, 1922, amounted to $5,339,267, an increase of $493,801 as compared with the previous twelve months, while net earnings were $2,507,803, an increase of $313,072, or 14.26 per cent.

Earnings of the company have been increasing consistently over a period of about ten years.

Earnings of the Southern Colorado Power Company, another operated utility property of the Standard Gas & Electric Company, for the twelve months ended Sept. 30, 1922, amounted to $1,823,329, an increase of $32,622 for the period. Net earnings were $690,414, an increase of $124,553.

Extending Gas Plant

Philadelphia, Pa.—Mayor Moore has announced that the United Gas Improvement Company is making a million-dollar improvement at the Port Richmond Gas Works, following recommendations of his gas commission.

The city owns the gas works, which are leased to the company, and the expenditure by the company on improvements is significant of the change in conditions since the agitation of the gas question a year and a half ago.

Financial Statements

The Gulf Oil Corporation is preparing to redeem its $35,000,000 twelve-year sinking fund debenture 7s due 1923, outstanding in the hands of the public. In lieu of these bonds there will be issued 5 per cent refunding.

The Standard Oil Company of California has notified the stockholders, "For convenience of stockholders the stock transfer books in New York will be opened on the morning of Dec. 6 instead of 11 to facilitate registration of transfers prior to the proposed date of record at the close of business Dec. 9, for contemplated stock dividends."

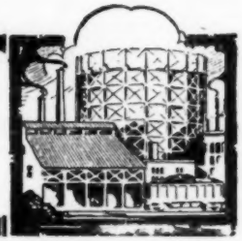
Royalties on Gas and Oil

From a report issued by the Bureau of Mines it is learned that the total net royalties accruing to the Federal Government through the production of oil, natural gas and natural gas gasoline on leased public lands during 1922, up to Oct. 1, amount to $7,879,909.

Gas Company in Temporary Quarters

Huntsville, Ala.—The Huntsville Gas Company has moved their offices from the burned district, the Echols' Building southeast side of Court Square to their temporary quarters in the Holmes Building on Franklin Street.

NEWS OF THE GAS INDUSTRY



Gas Rules Not in Conformity with Decision, Is Claim

Birmingham, Ala.—Declaring that gas service regulations filed by the Birmingham Railway, Light & Power Company under recent ruling of the Alabama Public Service Commission do not in the remotest degree conform to the decision of the commission, William L. Harrison, commissioner of public utilities, has written the public service commission making a vigorous protest against the proposed regulations, according to a statement he has just issued. The conclusion is almost irresistible that the company is seeking delay in putting into effect the ruling of the commission, Mr. Harrison stated.

Copies of the proposed regulations filed by the company were mailed to the city commission by the Alabama Public Service Commission Oct. 20, according to the statement. Mr. Harrison stated that he and City Attorney W. J. Wynn have gone over the proposed regulations carefully and that his letter protesting against the proposed regulations, which he maintains are absolutely at variance with the ruling in the case, was mailed to the public service commission Saturday. Tuesday he stated that he had heard nothing further from the public service commission.

According to the statement of Commissioner Harrison, the proposed service regulations filed by the company change the basis of deposits to be made for gas extensions from a cash basis to a footage basis. The public service commission in its ruling on the case, he said, held that the company must make free of cost to the consumer all extensions up to $94.30.

Regulations filed by the company for the approval of the public service commission, Mr. Harrison stated, provide that extensions up to 50 ft. in length be put in free and that for extensions of 6-in. main beyond 50 ft. a deposit of $1.18 per foot be required and that for extensions of 4-in. main beyond 50 ft. a deposit of 85 cents per foot be required of consumers.

Commissioner Harrison maintains that on this basis extensions of 6-in. mains would allow consumers a free extension of only $59 instead of $94.30 as provided in the ruling of the public service commission and extensions of 4-in. main would allow only $42.50 free without a deposit by the consumer.

No provision is made in the proposed regulations for competitive estimates of cost of extensions as provided in the decision of the commission, Mr. Harrison stated. He also pointed out that the regulations filed for approval provide that no interest shall be paid on deposits for extensions of more than 100 ft. He points out that the commission in its ruling provided that 6 per cent interest must be paid on all deposits for extensions for mains for domestic consumers.

If it is the intention of the public service commission to modify its former ruling, Commissioner Harrison asks for all information. However, he expressed the opinion that the commission does not intend to modify the ruling.

Flat Rate of Gas Company

Des Moines, Iowa.—Corporation Counsel John J. Halloran has been empowered by the City Council to enter into negotiations with the Des Moines Gas Company for a flat rate reduction.

This is said to mean that the city will refuse to consider the company's offer of a 5-cent reduction, made some time ago, which would reduce the rate from $1.24 to about $1.19.

At an informal discussion at council table, members of the council stated that they believed the company could make a much better reduction.

Paris Gas Strike Averted

Paris, France.—The strike of gas workers in Paris has apparently been averted. All employees of the four plants are at work.

The trouble arose through the deduction from employees' wages of money to meet their income taxes in accordance with the law.

Second Course Is Announced

The Iowa District Gas Association has announced that it will conduct its second course for gas meter repairmen on Dec. 5, 6, 7, 8 at the Iowa State College, Ames, Ia. The announcement further states that the Association extends an invitation to anyone interested to attend the course which is entirely gratuitous.

A pamphlet covering the instruction given in the first course in 1921 has just been issued and it gives in outline all of the phases of this important subject which was covered at the session. The booklet covers the construction, testing and repairing of both tin case and iron case meters and is so arranged that the meter repairman in a small gas company can use it as sort of a reference book.

Harry Hunter Dead

Members of the gas industry will learn with deep regret of the death on Oct. 28 of Harry W. Hunter, president of the Baltimore Gas Appliance and Manufacturing Company. Mr. Hunter had been ill for some time but it was hoped that he would survive the attack.

Mr. Hunter created an enviable position for himself in the gas field and by his industry and progressiveness built up a business that will always be a monument to him.

Big Street Lighting Installation

Announcement has been made that the Welsbach Street Lighting Company is at present making an installation of approximately 10,000 Welsbach burners in the city of Cleveland. It was also learned from the same source that the city of Haverhill, Mass., has renewed its contract with the company for a period of five years.

Holds Hearing on Gas Rate

Columbia, S. C.—Hearing on the petition of the Columbia Railway, Gas & Electric Company to increase its rates on gas has been begun by the South Carolina Railroad Commission and considerable testimony has been submitted. The commission will investigate, on its own account, the value of the gas plant of the company.

But little progress has been made in the hearing. Jo-Berry S. Lyles, representing the gas company, stated what the present gas rate is and the proposed rate, saying that the present rate was put on by the public service commission about a year ago, and said that it had been found that this rate was not sufficiently compensatory and that the company could not make the showing that was necessary in order to "borrow money which is needed to give the people the service we want to give." He spoke of the extensions of gas mains that were needed. Mr. Lyles then submitted the gas rates in a number of other cities, mentioning Mobile, Knoxville, Jackson, Miss., High Point, N. C., Jacksonville and Greenville, S. C., in all of which towns the rate was higher, according to the figures submitted, than in Columbia.

W. D. Barnett, representing the citizens' committee, held that the rates in other cities did not control the gas rates in Columbia. He argued that an equitable rate should be based on the amount of the capital invested in the gas plant, the expense of operating the plant and a reasonable income on the investment.

Charles M. Tew, auditor of the company, was the first witness called. Mr. Tew submitted figures to show the expenses and income of the gas plant, giving the value of the gas plant as of July 31, 1920, as $645,911.94, the cost of the new coal-gas plant as $358,948; added construction and gas meters installed ran the total up to $1,034,880.

Mr. Barnett wanted to know how the value of the plant, $645,911.94, was arrived at and also if the railroad commission was going to take, as the value of the gas plant, the value found by the public service commission. Frank W. Shealy, chairman of the railroad commission, said that the present commission would itself ascertain the money value of the plant.

Mr. Barnett contended that gas consumers should not be required to pay on an investment in equipment and gas mains that have been discarded by the company and that are no longer in use. He again asked the auditor, Mr. Tew, how the value of the gas plant was arrived at, and Mr. Tew said the figures submitted were from books and records.

After some argument, Chairman Shealy announced that the commission would itself make an investigation and report as to the value of the gas plant at the present time, and requested representatives of the gas company to submit a list of the properties and their locations so that the investigation could be carried on rapidly. This investigation will be made at once, and the hearing on the gas rate resumed next week.

Mr. Barnett said that when the hearing on the petition for an increase in the rate on electricity came up he would ask for a reduction in rates.

Natural Gas Being Exhausted in Ohio

Conneaut, Ohio.—That the natural gas supply of Ashtabula County is gradually dwindling and that a large artificial gas plant must be erected if the county is to continue to have gas is the statement just made by officials of the North Eastern Oil & Gas Company, of which F. B. Dunn, of this city, is president.

Since the people of the county joined hands two years ago and purchased this natural gas concern, it has been known that eventually an artificial plant would have to be built. The question was how soon this would have to be done. It is now considered quite probable that the matter will be started in the not distant future and that a plant sufficiently large to supply the entire county will be erected.

It is estimated that the consumers of the county, which includes Conneaut, Ashtabula, Jefferson, Geneva and several smaller places, will have a fair supply of natural gas during the coming winter, but that it is very desirable to have the artificial plant going before another winter.

It is proposed to mix the artificial and natural gas in order to get the benefit of what natural product is left in the county's wells. It is stated that an artificial plant capable of furnishing 2,000,000 cu. ft. of gas daily will be planned. Inasmuch as the average daily consumption at the present time is less than a million feet daily the new plant will easily be able to furnish all that is needed for both domestic and industrial consumption.

If the erection of an artificial plant is started in the near future it is estimated that one unit at least can be put in operation by next summer and that the plant could be in full operation by a year from now.

Gas Petition to Be Heard

Kokomo, Ind.—The petition of the Kokomo Gas & Fuel Company for a modification of the recent artificial gas franchise order will be heard by the Indiana Public Service Commission at Indianapolis, according to word received here.

Lex J. Kirkpatrick and Lloyd McClure, of counsel for the gas company, and Mayor B. C. Moon and City Attorney Fred Jessup are preparing points on the petition upon which they will argue.

The gas company has petitioned the commission for permission to have the Koppers-Kokomo Company incorporated under the laws of Delaware, because of laws there that permit issuance of non-par bonds which is not permissible in Indiana. The Koppers Company, of Pittsburgh, has threatened to give up the construction of a nartificial gas plant in Kokomo if it has to incorporate the holding company in Indiana and be forced to pay Federal income taxes on the lump sum of the investment, estimated at $600,000. Mayor Moon has contended for the incorporation of the company in Indiana since the plant was first suggested. He is expected to make a fight against it, judging from past statements.

Light Department Seeking Quarters

Westfield, Mass.—The municipal gas and electric light department is seeking a new location for its office and salesrooms. Notice has been served upon the officials of the department that the present premises must be vacated Dec. 1. For some years a sales department of gas and electric appliances has been maintained, and the officials wish to continue it. The commission is considering buying suitable property on Park Square for the offices and retail business.

More Oil Drilling in California

Drilling for oil or gas having been started near Trinidad, Col., where gas wells already exist may have been the incentive, or perhaps geologists surveys may urge it, the facts are that the Penuco Oil & Transport Company are going to drill for oil within three miles of the city of Morrison, Col., about twenty miles from Denver.

Should either oil or gas in abundance be found, especially gas, it would be a godsend to the folks in and around Morrison and the pipes could be brought into Englewood, the south end of Denver, a suburb that never has had the blessing of gas, most of the folks cooking with coal or kerosene stoves.

Just why the Denver Gas & Electric Company have never built an auxiliary to supply Englewood is not patent to the writer, but a gas plant at Englewood would pay now and the place is growing by leaps and bounds.

Yearly Earnings

Spokane, Wash.—Earnings of 9.9 per cent by the Spokane Gas Company was indicated on the company's report submitted to Commissioner Fleming recently.

Gross earnings of the company were $45,659.85 for September, and $522,916.86 for the fiscal year, the report showed. Operating expenses, maintenance and reserve totaled $32,898.84 for the month, and $408,192.07 for the fiscal year. A replacement reserve of $3,206 for the month, and $38,472 for the year was charged off.

Net earnings of the gas department on the $1,154,000 valuation set by the State was $12,761.01 for September, and $114,724.79 for the year or at a rate of 9.9 per cent for the year.

New Installation

The Kirksville Gas, Heat & Electric Company, of Kirksville, Mo., has placed order for reverse steam connections to go on one of their double superheater carbureted water gas sets with the Gas Machinery Company, of Cleveland, Ohio.

This new equipment will go on the water gas set formerly furnished by the Gas Machinery Company and will bring the set up to date so that the gas company in Kirksville will be able to take care of their increased send-out.

Denver Company Installs New Apparatus

Denver, Col.—The Gas Machinery Company, of Cleveland, Ohio, has been awarded contract by the Denver Gas & Electric Light Company, of Denver, Col., for an eleven-foot double superheater carbureted water gas apparatus.

This new water gas set will be placed adjoining the two foot eleven inch sets that the Gas Machinery Company has installed in Denver in the past and the set is now being erected for completion at an early date.

With the coal gas equipment and water gas equipment that the Denver Gas Company now has available, it will be able to insure the same high grade of service to its customers that it has always given in the past and also take care of additional new business.

Denver Gas Company Vs. Denver City

The Denver Gas & Electric Company has paid another $25,000 to the city of Denver, and their franchise tax is now paid up, if they pay an additional $12,500 on Jan. 1.

So far, so good, but the city claims that the gas company owes them something like $1,000,000 for overcharging the consumers the stipulated rate of 75 cents a thousand cubic feet, but the gas company denies all of this, claiming that part of the agreed franchise is "nix," and the courts have it under advisement.

Gas Plant Burns at Lemars

Lemars, Iowa.—Fire has destroyed the gas plant here, causing a loss of nearly $20,000.

The electric cables were burned also, leaving the city without lights.

Financial Statements

H. M. Byllesby & Co. announce that the board of directors of the Louisville Gas & Electric Company has called for redemption on Dec. 1, 1922, the entire outstanding issue of $14,572,000 of first and refunding bonds at par and accrued interest.

The Standard Oil Company of California has declared the regular quarterly dividend of $1, payable Dec. 15 to stock of record Nov. 29.

The Standard Oil Company of Indiana declares its regular dividend of $1 a share payable Dec. 15. The date of closing of books not mentioned.

The Louisville Gas & Electric Company are offering $18,805,000 first and refunding mortgage thirty-five year 5 per cent bonds. Price 91½ and interest, or on about a 5.60 per cent yield basis.

Gas for Salt Lake City

Among the gas people at Laramie, Wyo., there is a report that the proposed gas line from Baxter Basin field near Rock Springs, Wyo., will be extended from Rock Springs to Green River and on to Salt Lake City to supply the Utah metropolis with natural gas.

If this is done it is likely that the line will also go through Ogden and would garner a good business there. The same applies to all cities en route.

The well averages 35,000,000 cu. ft. daily, and other wells are being sunk. Possibly the outcome of the new drilling will decide the matter.

New Water Gas Apparatus Installation

A contract has been awarded to the Gas Machinery Company, of Cleveland, Ohio, for a complete ten-foot blue water gas apparatus to be installed in the plant of the M. W. Kellogg Company, Jersey City, N. J.

This is the fourth blue water gas set that the Gas Machinery Company has installed in this plant for the above company and is going into the new plant which has recently been built outside the city.

The former three blue gas sets have also been moved to the new plant, which will be a model of its kind in every particular.

New Drilling Rule a Benefit

Operators in the Salt Creek field held a meeting at Casper recently at which an agreement was reached whereby all drilling operations in the field are to cease between Dec. 1, 1922, and May 1, 1923. It was further agreed that no new wells should be started subsequent to the date of the meeting, Sept. 20, and prior to the date for the general shut-down. Many of the wells now drilling will be completed by Dec. 1, but those not yet in the sand on that date will cease drilling until the opening of the spring season next year. Exceptions are made where drilling is necessary to meet lease requirements and where postponement of drilling cannot be arranged.

The purpose of the plan is to prevent as far as possible the further increasing of new production in excess of what the pipe line and refining companies are able to handle and to prolong the life of the field. If the program becomes fully effective it will not curtail the amount of oil being run from the field and therefore will not cut down the revenues of the producing companies. On the contrary, it will reflect favorably on some income accounts through the reduction of drilling expenses for the period of the shutdown. A further potential benefit will be the favorable effects it will have on the price of crude which might easily go lower if drilling continues unrestrained and may go higher if production is curtailed.

The situation in the field requires diplomatic handling and is liable to change at any time. Facts brought out at the meeting of the operators show the conditions as they exist at this time. Last December a ten days' test of all wells at full capacity was made for the purpose of arriving at a basis for pro-rating the runs. This test showed that the completed wells were capable of producing 85,000 bbl. a day, while pipe line capacity around 50,000 bbl. On Jan. 12, 1922, the pipe line companies began taking 40 per cent of the production. Since then wells have been drilled which bring the present capacity of the field up to 165,000 bbl. a day, and if one more well is drilled on each tract entitled to have a well drilled the production will be around 200,000 bbl. a day. The mounting production figures resulted in July in the amount of oil taken by the pipe lines being reduced to 30 per cent. It is believed that if present drilling programs of all producers were carried out that more drastic restrictions on runs will follow or that it will result in cheaper oil and the running of the surplus into storage.

Warning Card Given Natural Gas Users

WARNING—READ CAREFULLY

The main danger incident to the use of natural gas arises from an escape through an open pipe, valve or cock or from a leak in pipes, fittings or apparatus in the customer's house and premises.

To avoid danger, upon noticing the odor of gas immediately comply with the following:

1. Do not search for leak with lighted candle or lighted match or flame of any sort.
2. Open all doors and windows in the room where odor of gas is detected.
3. Extinguish all flames.
4. Close all gas valves and cocks.
5. Shut off gas at meters.
6. Call a plumber to fix the leak.
7. Notify gas company's office at once.

No flame of any kind should be permitted on premises until escape of gas has been effectively stopped.

A gas company is not responsible for any personal injury, damage or loss which may arise from the escape of gas in the patron's house or premises.

The use of water heaters without flue connections is dangerous to life and property.

All gas heater should be connected with a flue and the use of gas heaters without flue connections in small or poorly ventilated rooms is especially dangerous. Modern radiant heaters that set well back in fireplace having flue are safe.

Rubber hose connections are dangerous and should be replaced with iron pipe connections.

Important.—In selecting your heating stoves and appliances be sure to select them sufficiently large to furnish the heat required without increasing the flame beyond proper height. All flames should at all times be confined within heaters, as flames issuing or leaping from heaters may cause fire, injury to person or damage to property.

Open gas stoves should be protected by screens or guards, as even when the flames are entirely confined within the stove, clothing may swing into the flame within the stove and catch fire.

Gas stoves when properly used are safer than stoves using any other fuel, but it is necessary, as with any other kind of fuel, to be careful.

These admonitions are for your benefit. The service pipe from the street curb into building or house is the property of customer. A gas company is not responsible for the escape of gas from customer's pipes, fixtures, service pipe, or apparatus or condition thereof. Nevertheless, the company is naturally especially desirous of eliminating every element of danger wherever possible, and will be willing to assist, at any time, in seeing that you get good gas service.

Natural gas is the safest fuel known, but do not be careless with it and do not waste it.

HANG THIS UP IN YOUR KITCHEN

New Equipment Installed to Meet Increased Demand

Ann Arbor, Mich.—Reports from gas, electric and street railway companies in Michigan indicate that extensive additions to plant and distribution equipment have been necessary during the past few weeks, to keep pace with the growth of cities in the State and the increase in consumption. A summary of the two most important gas installations reported to the Michigan Committee on Public Utility Information follows:

Marquette's gas plant, now under new management, is installing considerable new equipment. City-wide surveys are being made to determine the condition of the ditsribution system and the amount and variation of gas pressure. New mains will be laid to care for expansion of the city. Testing instruments will be installed to determine heat units.

The Battle Creek Gas Company, which also serves Marshall, has installed a new process for the removal of sulphur from gas known as "liquid purification." It is the first of its kind in the United States and is proving very efficient. Battle Creek's growth is shown, in that 124 new meters were installed this year and two more miles of pipe laid. The construction program provides for an additional 6,000 ft. during the remainder of the year. In Marshall, service has been augmented by the laying of 1,300 ft. of pipe extensions this year. Proposed extensions for next spring will add 1,000 ft.